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THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

Vol. XI January-December, 1939

Plant Industry Sub-branch
UNITED STATES
DEPARTMENT OF AGRICULTURE
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BOOK NUMBER 1.9
P772
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1939
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THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI

Washington, D. C., January 1, 1939

No. 1

"Nobody Told Me!" Of all sad words of tongue or pen, the average administrative officer dreads most these three: "Nobody told me!" They are the words that invariably greet his ears when some one forgets, makes an error, hurts himself, or manages in some way to upset things. And yet though there are numerous organizations that have trained guides who show visitors about and explain what is being done, it is almost unheard of to find such guides available to explain to employees what is being done--the what, how and why of the organization and its work.

In our Division we have given the job to the News Letter. It is your guide and counsellor. Rather, that is its aim; it still needs a good bit of target practice. We could fill its pages with instructions and scoldings, but the general idea is to make it a guide post rather than a whipping post, and we plan to go along with contributions from field workers and incidental stories of outstanding achievements that will give you a clear idea of what your colleagues are doing for the benefit of horticulture in the interest of the general welfare. Such administrative notes as we feel compelled to include are inserted primarily to save you time and money, and only incidentally to make things a bit easier for the Business Office!

Leaders of commercial enterprises spend considerable money and devote much thought to the encouragement of team play among employees, realizing that while each section and even each employee should be given a degree of independence of action and initiative, the best results are possible only where all parts of the organization intermesh effectively. To bring about this effective cooperation it is desirable that the individual employee be given a clear understanding of the general objectives

of the work as a whole. When a section makes an island of itself it becomes less useful in the promotion of the general ideals of the Division. An employee, too, who performs day after day and week after week some relatively simple or routine task is not likely to get from his employment the degree of happiness and encouragement he should have unless he is made to see rather clearly that his work is actually a vital part in the Division's program, and that he has an important place in its drama of production.

"NOTHING LIKE VICTORY FOR BOLSTERING UP MORALE"

A writer on personnel management has said that there is nothing like victory for bolstering up morale. He had in mind the importance of emphasizing from time to time some accomplishment of the organization that carries with it a sense of a victory won. We in the Division of Fruit and Vegetable Crops and Diseases are fortunate in being connected with work that constantly produces results of outstanding usefulness and importance. When one of our associates, or a group of our associates, creates a new variety that saves some fruit or vegetable industry from ruin; when we suggest changes and improvements in methods of handling and transportation that save the growers of a single locality hundreds of thousands of dollars each year; when we advise a producer who has spent \$60,000.00 fruitlessly in the search just how to put up his product in a satisfactory manner to ensure commercial success, we know we are on a winning team! All these things can be done--they have been done--and we are doing them!

PLANNING THE DAY'S WORK

A corporation president asked an employee for a certain paper and stood by while the latter rummaged in his desk looking for it. The paper refused to appear. The face of the employee grew red. The president, new to his job, did some rapid thinking. He went from desk to desk demanding: "Do you know what is in that drawer?" The employee would say that he did, but called on to describe the contents of the drawer he invariably failed. "Dump the contents of the drawer out in the alley and burn it!" directed the new president. The inauguration of this house cleaning was marked by a costly illumination in the alley back of the building and a considerable number of important records were destroyed--but the president always insisted that in the long run it was a good investment!

Do you know what is in your desk? asks the system expert who told this story. When a telephone call comes for some forgotten paper, do you conscientiously say "Hold the 'phone," and make a one-hand stab that means business, or do you beat about the bush and finally agree to "call you up later," and then get down on your knee and set about to hunt through the desk? A desk is a work bench, not a junk pile. It should contain merely the tools you need, readily accessible. What would you think of a carpenter who each day left his tools buried under the chips and shavings of his work?

"He who every morning plans the transactions of the day and follows out that plan carries a thread that will guide him through the labyrinth of the most busy life," asserted Victor Hugo. So, with your tools in place and quickly available, the next step is to know clearly what you have to do and how you propose to do it. Since performing is the step that immediately precedes results, we sometimes fall into the error of placing too much emphasis on it. Before performing there is a vitally important step--planning. For effective performing, we must have efficient planning. We can find an inspiring example in almost any of our bulletins. Take up one and examine it and you will see that the writer has mapped out a clear and definite program for his reader. He describes his particular crop plant or procedure, touches on soils, fertilizer, cultivation, planting, pruning, disease prevention and cure, insect enemies, handling, transportation, storage, and utilization. He tells about varieties--those for general use and those for special purposes. To plan our work as efficiently as our average bulletin is planned--that appears to offer a mark at which to aim.

THE EFFICIENT WORKER

Illustrating the importance of knowing the best way to do a thing is a story of the late Dr. Luther Gulick, well known authority on physical culture. He and Harrington Emerson, the efficiency expert, were attending an athletic meet. One of the events was to be swimming under water for distance. As one of the boys passed, Dr. Gulick asked him if he intended to enter the race. The boy replied that he did not, that while he could swim under water fairly well he had not trained for the event and felt he had no chance of winning. Dr. Gulick took out his watch and asked the boy to see how long he could hold his breath. The test showed 56 seconds the limit. "There are people who can hold their breath three or four minutes," said Dr. Gulick. "You just don't know how to do the trick. Now, breathe deeply and slowly several times, over-oxygenating the blood, and we'll test you again." Following the instructions the boy found he could hold his breath a full two minutes. The three then went over to the swimming tank and Dr. Gulick timed the boy to determine how many strokes he averaged to the minute. It was 16. "Now," he directed, "enter this race. Dive and hold your breath until 24 strokes are made--a minute and a half. You know you can do that. Just dive and swim under water for 24 strokes, that's all." The boy followed instructions--and won the race.

You know that you might call in a group of persons without previous experience in office work and put them on a simple job and you would find as much as 75 percent difference in mere quantity of output, to say nothing of quality. Explain the simplest way of doing the job, and the difference will drop to as little as 10 percent. This isn't a guess; it is the usual result to be expected from efficiency tests of this sort. The untrained employees "just don't know how to do the trick." That is what makes so important the planning of your work, the effort to find out the best way of doing things--the Stop, Look and Listen of working efficiency.

SELF RELIANT ENTERPRISE

A good many employers would prefer a worker somewhat lacking in intelligence and all around ability to one falling short in that form of self-reliant enterprise we call initiative. Particularly exasperating to most administrative officers is the worker who never learns to find things to do, but who stands around waiting to be told to do this or do that. One such girl, a splendid stenographer, assigned to a research specialist who had comparatively little dictation to handle, became so miserable that she took her troubles to the chief clerk.

Fortunately the chief clerk was a man of understanding and he took the time necessary to visit her office and point out to her that it was not necessary for her to sit around idle, waiting to be told what to do. He called her attention to several hundred valuable bulletins and separates that needed to be filed and indexed for ready reference. He pointed out that there was no desk telephone list of persons her chief called up frequently; no address list of his main correspondents and workers; no follow-up file of correspondence to ensure prompt answers.

He suggested that she devote some of her idle time to a careful reading of the Department Regulations and the general memoranda of the Bureau and Department so that she could relieve her employer of much of the routine work in connection with checking of travel accounts and other official papers, the correct preparation of letters of authorization and other forms. He picked up a copy of the Style Manual of the Government Printing Office and explained to her how easy it would be to learn to take care of the preliminary details and minor editorial changes in connection with manuscripts submitted for publication, details that, properly cared for by the section, do much to speed up publication.

He went on to emphasize the desirability of acquiring a familiarity with the publications of the Division and especially those of her own section, so that she would have less difficulty with technical terms; etc. He told her of one secretary who had called on him for information about a certain bulletin--to have him tell her that it was one of her immediate employer's publications, filed in her own section!

In other words, the chief clerk, in a nice way, made this girl feel like a fool--but he also showed her the way to become one of the most valuable secretaries, and one of the best paid, in the Department. That was many years ago, but probably conditions have not changed materially. There is nothing to be ashamed of in admitting that there is much for most of us to learn about our jobs. After all, our observation of fruits and vegetables should teach us that it is the green thing that is growing; when it is ripe it begins to rot! There is, too, the added value of aroused interest in a job as you begin to understand it better and to feel a sense of participating in worth while accomplishments. And there isn't a section in our Division that doesn't have a background of worth-while achievements.

GET ACQUAINTED WITH YOUR JOB

It is difficult to imagine a job that wouldn't be interesting if one really got fully acquainted with it. That's the reason the world pays such outstanding salaries to the superlative performers in apparently trivial fields--it's a tribute to the industry and perseverance of the artist. The oyster, which probably is not a bit more intelligent than the average man, even manages to transform a constant source of irritation into a pearl. Here is a hint for workers who feel they are temporarily in a job that is a constant source of irritation--turn it into a pearl! As some philosopher has said, until we have been pushed beyond our limit, we've never actually done our best.

Familiarity with the job isn't common. One of the surprising developments in connection with the work of employment agencies during recent periods of unemployment has been the discovery that so many workers, formerly in important positions, were actually entirely out of touch with recent progress in their own fields of work. There was the specialty engineer who came to one of the New York employment agencies seeking a job and insisting that he knew every expert in the world in his particular field and that there was not a modern installation in his particular profession with which he was not thoroughly conversant. He was turned over to a successful engineer, one of the consulting experts of the agency, who in less than ten minutes of questioning found that the man was not acquainted with two recent important developments in his line of work, and did not know the latest and most modern installation pertaining to his own particular specialty. Neither did he know that a large corporation had been formed a few weeks before to exploit new equipment in his own line. He had simply forgotten to look beyond the walls of his own job.

Just as the research worker benefits by keeping in touch with the journals in his field of work, the clerical employee may benefit from keeping in touch with journals concerned with office methods and equipment. Listening as well as reading helps. Sometimes we have a tendency to turn away representatives of manufacturers who call on us, for example, overlooking the fact that these concerns wouldn't pay high salaries to these men if they didn't know their jobs and have something important to tell. Even if we do not need the particular article or equipment being demonstrated at the time, it is just as well to listen carefully. Manufacturers are constantly improving their products and if we are to keep up to date we must of necessity know what new things are being developed and which might be used to advantage in connection with our own work. We have a very good illustration of the importance of this in our own Division. Because Roy Gillette has done a lot more listening than talking during his official life, we seldom call on him for advice in practical matters without receiving prompt and effective help. If he happens to be fired before this gets into print, you may rest assured that he will be able to convince a prospective employer that he has kept absolutely up to date in his field!

HELPFUL HINTS

Reading her shorthand journal, one private secretary was much impressed by a note concerning the importance of making extra carbon copies of letters and memoranda to meet special needs. Most typists dislike to make extra carbons because of the additional trouble where corrections must be made, but as a matter of fact the dread of these extra corrections actually does a lot to make the typist permanently more accurate.

Probably most executives have at times been reminded of the value of an extra carbon copy or so. In fact the Department's Director of Finance has stated that in his own experience he has frequently been inconvenienced by failure to receive a carbon copy of a letter addressed to another person and containing information he should have had. Whenever a person dictates a letter it is a good idea for him (or his typist!) to consider whether some one in addition to the person to whom the letter is addressed should receive a carbon copy. Some occasions, of course, call for an extra carbon copy to accompany the original letter--as with Congressional correspondence in our own Division--particularly where a writer is answering an inquiry made by the addressee on behalf of a third party. If he accompanies his letter by a carbon copy the addressee may often save the writing of an additional letter merely by forwarding the carbon copy.

Well, the young woman who read the suggestion in her shorthand magazine, and adopted the practice, has done very well and at least her first promotion was actually the result of the extra-carbon plan. Incidentally, she seems to have acquired a carbon complex, for she told me sometime ago how she was saving on carbon paper by not discarding it when copies became faint--where she was making five or more, that is. She merely puts in a fresh sheet of carbon at the back for the last copy each time as the copies become faint. And she saves the discarded carbon because she says that carbon that makes only a faint copy where four or five are needed is still capable of making excellent carbon copies where, as with most correspondence, only one or two carbon copies are needed. She also clips a corner of the carbon paper to make it easy to remove all the sheets quickly from between copies; and for a time she used carbon paper a half inch shorter than the paper typed on so it would show through and warn her when she was getting close to the bottom of the page!

It is truly amazing how a simple suggestion will help sometimes in smoothing out annoying procedure. There was a section that used a system of 3x5 colored cards in connection with one series of experiments. The annoyance came from the difficulty in keeping an adequate supply of each color of cards on hand; and of seeing that the color matched in succeeding orders for cards. One of the clerks suggested that plain white cards be used, the top edges colored with drawing ink and a bit of absorbent cotton or cheesecloth. The plan was tried and worked perfectly, the colored edges of the white cards standing out just as clearly in the file as the all-colored cards.

The same section used a very satisfactory plan for sorting out these 3 x 5 cards alphabetically for filing. A heavy sheet of cardboard was marked off in spaces just a trifle larger than 3 x 5 inches, with the letters of the alphabet written at the bottom. It was easy to sort out the cards on this frame. Where the work was interrupted the frame was merely placed on top of a filing case or somewhere else where the cards already sorted would not be displaced.

Years ago one of our field men was a marvel to the Business Office for the reason that his vouchers and other official papers were always in order, made out properly, correct number of copies, and so on. Our curiosity finally mastered us and we wrote and asked him how he did it. He explained that he kept a little "How" box of 3 x 5 cards on his desk. On these cards he listed the correct procedure for each voucher and official form. Consulting these he had no difficulty keeping his vouchers in order. Later we found that Bill Barger, then at Indio, Calif., had an even simpler method: He merely pasted over his desk a typed sheet listing the various forms by number or name and indicating copies needed, to whom they were to be sent, etc.

Lately I have seen still another method. You know that many workers place glass on their desk tops and under it slip all sorts of memoranda needed for quick reference. Well, a worker who uses a typewriter desk and cannot have a glass top, has had the carpenter plane off the under side of the two slides or reference shelves above the top drawers on each side of his desk. Then he has had glass tops fitted on these slides. Under the glass he slips his memoranda, just as such things are slipped under the ordinary desk top. Of course by planing off the under side of the shelves there is room made for the glass so the shelves are just as available as arm rests and for writing space as they were before the glass was put on.

One of the things he has under the glass is a list of frequently used telephone numbers, which reminds me that telephone messages are often overlooked because no record is kept of them. One very successful practice is to have all such messages noted on ordinary 8x10-1/2 sheets, showing name of person calling or called, date, message, etc. On the back of the sheet is notation of action taken, and the sheet is then filed like correspondence. This is for use, of course, only where the message is worth recording! You have to trust your employees to that extent. As a matter of fact, it might be a good plan to get in the habit of trusting minor employees in a good many things as there is nothing like responsibility for developing latent abilities, and interest, in most workers. The Civil Service rules are strict in the matter of mis-assignment of workers and we are thus under obligation to assign employees to duties within their examination statue, but this must not be interpreted to mean that the worker shouldn't from time to time be given duties a bit beyond the scope of his ordinary work. It's the best way to develop efficiency quickly--and quite often you'll be surprised to find how intelligent the average minor employee is!

MEMORY AIDS

The latest models in stream-lined efficiency no longer make their minds a junk heap of accumulated data. They sweep out all except the important things and simply make sure, for the rest, that they know how to find the information when and if needed, and that they will be reminded to do certain things at the proper time without burdening their minds with remembering. Hence the importance of memory aids.

The simplest is probably the ordinary desk calendar pad with its leaf for each day of the year. Note on February 11 leaf the thing you wish called to your attention that day and it will stare you in the face the morning of February 11--unless you forget to turn the page! Its weakness lies in its space limitation, so we turn to what is called the office "tickler," a box with 3x5 cards and guides. There are 12 guide cards, one for each month of the year; and 31 numbered cards, for the days of the month. The numbered cards stand in front of the file and carry the data for the current month. This is January: Well, back of the No. 11 guide will be the 3x5 notes concerning things to be taken up on January 11. If something is to be called to your attention on January 24, a note is placed behind the No. 24 guide; if it is not to come up until June, then it goes behind the June guide in the back of the box.

Some workers substitute a letter size file for the 3x5 cards, keeping it in the large drawer of the desk or in a file drawer if the desk has no large drawer. There are 12 folders, usually near leather with an expansion of an inch or so, for the months; and 31 ordinary file folders for the days. As with the "tickler" matters for attention January 11, say, will be in the No. 11 folder. And so on. It is not necessary to put the actual papers in the folder; all that is needed is a reference to them. The original papers may be kept in the general files, available to all.

"Unfinished business" at the end of each day, or references to it, is placed in the folder of the following day. Thus if you are ill or absent for some other reason, the employee who takes over your work can look in the folder for the day with the assurance that in it is all your unfinished business for that particular date.

When a letter is written to which it is desired to ensure a reply, an extra carbon copy is made and placed in the file so that it will come to your attention on the date when a reply should logically have been received, and you can write again if necessary or take other action toward securing the desired reply. Work for the entire year can be taken care of in this file as it prevents forgetting if even the roughest sort of memorandum is placed in the proper folder. It is especially useful in making certain that pay rolls and other papers due on specific dates get started at the right time, contracts renewed, etc.

THE COMPLETE LETTER WRITER

With the assembling of a recent Congress, the newspapers reported the advice given by a veteran member to a group of new Congressmen. If they wanted to keep their jobs, he told them, they should make it a rule to answer letters promptly. "Reply first," he urged, "to those letters written in pencil on tablet paper. They come from somebody at the head of the creek who will be your friend for life."

That is excellent advice for us, too, for a single letter may have a decided influence in winning a friend or making an enemy for the Division. We must always try to put ourselves in the place of the inquirer and so realize that the note on wrapping paper may be of very great importance to him. The manner in which we reply is quite likely to determine whether he is to have a friendly attitude toward us in the future. Promptness in replying implies, of course, an immediate acknowledgement. Sometimes it will be impossible to furnish the information immediately. In such instances, acknowledge the letter at once and explain that the information will be sent as soon as practicable.

Occasionally the volume of correspondence is such that you cannot give it the attention you wish; hundreds of letters sometimes come to us in a day as the result of a newspaper item, etc. It is frequently possible to meet this situation by using "form" paragraphs. Most offices having a large volume of correspondence find that the letters fall into definite classes, the same question being asked over and over. By assembling a dozen carbon copies of replies you have dictated, you can usually work out standardized paragraphs for the use of your secretary or assistants in drafting replies for your signature. Such standardized paragraphs, being carefully edited versions of your best letters, are actually more satisfactory than most originally dictated letters, since they are certain to give all the information available, including things that might easily be overlooked in a hastily dictated reply. And it is not difficult to fit the form paragraphs together judiciously so that they became in effect originally dictated letters.

Handle form letters with care! There is a story of a man who had written a hotel complaining about a sleepless night there, and explaining the reason. He received a beautifully worded letter of apology and was completely mollified until he happened to notice that his own letter of complaint had been accidentally returned. On its margin was penciled: "Give this guy the bedbug letter."

Standardized letters, even though the material has been prepared and approved by the specialist concerned, should not be signed in his name in his absence. If he is out of town the standardized letter should be modified by the explanation that Dr. Blank is out of town and that the matter will be called to his attention immediately upon his return so that he may supply further details if considered desirable. A person not adequately trained in a specialty may not appreciate the significance of a set of conditions involved in what might appear to be a simple inquiry, hence the need for caution.

PHOTOGRAPHS FOR OUTSIDE USE

Speaking of letter writing, why is it that so many of our employees write Roy Gillette or Walter Roney asking them to obtain this or that publication instead of writing direct to the Experiment Station or other issuing office for it? Benjamin Franklin is credited with the assertion that if one wishes to be certain a thing is done, he must go and do it himself. Probably Adam really said it first, but of late years we have come to recognize that the efficient executive is one who can delegate authority successfully, the difficulty being to make certain that the delegating does not degenerate into what is known as "buck passing."

The leading illustration of "buck passing," however, is in connection with supplying photographs for outside use. A request for such photographs apparently throws the average employee into a panic. What to do! And around and around the request goes, whereas the proposition appears to be rather simple. Usually such requests cover merely one or two or at least a small number of prints of the smaller sizes--for use in articles being prepared by Experiment Station and Extension specialists or others, or for use in outside publications. We are permitted to supply such prints free of charge in limited quantities where they are to be used in the public interests.

Ordinarily we supply only photographs that have been used in one of our publications, either in the Department series or outside journals, these being sent out over Mr. Gould's signature with the request that if used credit be given by stating: "This photograph is reproduced from _____."

It is sometimes permissible to furnish previously unpublished photographs for use in special articles primarily presenting the results of some phase of our work. Care should be taken, however, to make sure that we furnish no photographs apt to be needed later for our own publications --and all unpublished photographs must be submitted to the Chief of Bureau for approval, through Mr. Gould, before being sent out.

This appears to be all there is to this seemingly puzzling situation, though we may add that where a considerable number of prints are asked for, or there are technical details involved that will increase the cost materially, the negatives may be sent to the Office of Information, which will provide the needed prints and make a nominal charge for them, the money being deposited in the Treasury, where it may be credited to the appropriation charged with the cost of making the prints.

Where requests seem to demand special attention, or it is necessary to have prints made in the Division, they should be referred to Mr. Gilbert for attention, accompanied by negatives from which prints can be made. (Negatives of published material should really be turned over to Miss Guernsey for her photographic files, to be readily available when extra prints are needed.)

TRAVEL ACCOUNTS AND OTHERS

"Many employees who are required to travel on official business seem to think that suspensions in their reimbursement accounts reflect upon their ability, honor, or integrity, and are therefore proper subjects for protest or criticisms, all of which involves delay, friction, correspondence and unnecessary expense.

"Reimbursement for expenses incurred by employees who travel for the Department can be secured only when the expenditures are legally made; that is, for objects and in the manner prescribed by law or the decisions of the Comptroller, when authorized in advance by the proper officials of the Department, when made in accordance with the Regulations, and when examined and approved by the proper administrative officials..."

When an employee performs travel for the Division, he is presumed to have at least a general familiarity with the Regulations, and he is supposed to have read his letter of authorization and other instructions with care. Before incurring any expense he should be certain that the particular expense or travel has been authorized. And he must, of course, obtain receipts where required by the Regulations, and in particular keep some form of diary that will permit him to make up his accounts accurately and in full, time of arrival and departure, class of transportation used, etc.

Many employees who are proficient in carrying on research investigations or other work are not particularly skilled in preparing accounts. As a matter of fact a good many of the suspensions made in connection with travel accounts result from the employee's inability to add correctly. An astonishing number of our travelers do not appear to know that the Government is allowed a special rate for telegrams--or that radio may frequently be used instead, without cost to us. And occasionally reimbursement vouchers come in filled out incompletely--some of them not signed.

The requirements of the Regulations, necessary to safeguard the expenditure of Government funds, are many and various. It is not surprising, therefore, that when an employee comes to make up his accounts minor errors and discrepancies will escape his notice. The important thing for him to remember is that the final word on his account will be spoken by auditors expert in their field but often without a clear understanding of the conditions under which the work involved was performed. Your account must be self-explanatory. If any of the items appear at all questionable, be sure to explain them carefully--showing necessity for expenditure. Be careful, also, to itemize the expenditures so that the auditors can check reasonableness of cost. If some of the restrictions placed on you seem unreasonable, try to remember that it is your tax money, along with that of others, that is being safeguarded and that the rules of necessity have been drawn to meet the general demands of the situation and sometimes may seem to work injustice here and there.

LETTERS OF AUTHORIZATION

There is something about a letter of authorization that seems to arouse a high degree of stubbornness in some of us. Most of our staff appreciate the importance of giving the Business Office sufficient advance notice in connection with the issuance of such letters, but you'd never suspect it from their actions. The way they act about letters of authorization conveys the impression that they are firmly convinced that they positively must not send in a request for one until they know definitely the exact day on which the trip is to begin--usually, of course, tomorrow! So it happens that about half of the requests for letters of authorization that reach us have to be "rushed." This means, of course, that the workers in our own Division as well as those in the Administrative and Accounting sections of the Bureaus, must put aside their regular work and give preferred attention to your request--which it really doesn't deserve. Clerks dread requests for letters of authorization because they know that seldom is sufficient time given for the necessary care in preparing them. Mistakes occur and blots appear on efficiency records.

Since it is usually rather definitely known that trips will have to be made at certain seasons, the logical procedure would seem to be to send in requests for letters of authorization at least two or three weeks in advance of the effective date. The number of days allowed for a trip are counted from the date on which travel is actually started, not from the date of the letter of authorization, and the traveler may leave at any time after the date of the letter, during the fiscal year, so that no harm is done by asking for a letter a couple of weeks before you are going to start. This two or three weeks permits the Business Office to smooth out any questionable points and if desirable to secure an efficiency itinerary from the Department's Traffic Office or the railroad involved.

Where it is necessary to telegraph for approval of a trip, it means that the traveler must usually start without actually seeing the letter of authorization, opening the way for plenty of future trouble through lack of knowledge of its actual provisions, as sometimes it may fail to catch up with him until the trip is practically over. Of course, requests for permission to attend meetings should come to us a good bit ahead of the meeting date, as these must be sent to the Secretary's office for approval.

Where single trip letters are concerned, you can keep track of expenditures on the back of your copy so that you can see when you are running short of funds and so be able to write, or telegraph, for a possible increase. With station or general letters of authorization, you should use the ring-binder record sheets that are supplied by the Business Office for your convenience.

VISITORS

"When a visitor enters our office at Washington or comes to a field station to ask for information," wrote a former Assistant Secretary, "we do not know whether he has simply walked across the grounds or has traveled many miles. And that doesn't matter, for any citizen, as one of our stockholders, is entitled to the best help we can give him."

The first thing we owe a visitor is a courteous reception. The employee who greets him can make him feel at home by sounding at once the note of service that should dominate our policy. He shouldn't ask gruffly, "What is it?" Instead he should attempt, tactfully, to learn the visitor's name and the information he wishes. It may be that he desires to see Dr. Blank and Dr. Blank is out of town or engaged on important matters so that he is not accessible. A curt "He's out of town," or "He's busy and can't be seen," may be true, but it is short on tact.

"I am sorry, but he is out of town," or "He is engaged and can't be seen today," should be supplemented by an attempt to find out whether one of Dr. Blank's assistants or associates could not give the information needed. Very frequently visitors have been sent to see Dr. Blank as having knowledge of a particular subject. They often think that he is the only person in the Department who knows anything about this particular subject. Very few people have a clear understanding of the work of an organization such as our Division, for example, or appreciate the fact that there may be several specialists who are generally familiar with the work upon which Dr. Blank is engaged. A good opening would be, "If you are seeking information on the work upon which Dr. Blank is engaged, we can introduce you to one of his associates who may be able to give you the information you need, and save you the trouble of making another trip here." If, however, the visitor clearly needs to see Dr. Blank personally, care should be taken to obtain his correct name and address and his telephone number in case he is stopping in the city.

Another type of visitor is one who does not wish to see anybody in particular, but who wants to get information somewhere about some problem. He may not be able to state in very definite terms just what he wants. Care is needed to see that such a visitor is promptly referred to the proper person, and not sent from one office to another until he has seen several different people. This not only wastes the time of the visitor and the various specialists to whom he is improperly directed, but is quite apt to be a source of general irritation. If the first person who receives a visitor will take the trouble to find out the exact information he seeks and sends him directly to the proper specialist, the Division's reputation will be helped considerably. It is much better to spend a little time telephoning to get the proper information than to send a visitor marching from this office to that, wasting his own time and that of every one he meets, until he finally is satisfied--or allowed to leave in a disgruntled frame of mind.

COOPERATING WITH COUNTY AGENTS

Occasionally a member of the staff is criticized by some county agent or other person because he has ignored the latter. A county agent may write to complain because one of our specialists has been in his county and "passed him up"--did not make any contact with him. In general we feel that a representative of the Division on going into a county either for the purpose of making observations from some industry standpoint or to locate experimental work that is to continue more or less indefinitely, would do well to get in touch with the county agent.

Mutual benefit is always possible from such contacts. The Division's representative goes out as a specialist. The industry that attracts him to a county is in all probability of sufficient importance to have received attention from the county agent. In such a case, each in his own way will be benefitted by contact with the other. Again, if the Division's representative visits a considerable number of growers of a particular crop on which he is working, and later these growers talk with their county agent in regard to their visitor, it is likely to be a cause of embarrassment to him if he is compelled to confess ignorance of the presence in the county of the Department man. The general public, not familiar with organization details, may easily conclude that there is lack of harmony and coordination in the work and among the workers. Besides, there is the matter of official courtesy, which though it may not seem to amount to much in any one case, helps mightily to oil the ways and make the going smooth. After all, courtesy, wherever it is found, is nothing but an application of the Golden Rule.

No hard and fast course of procedure can be laid down, nor is it desirable. Every case should be determined by circumstances. Of course our Division representatives are research men for the most part. In going into a State their first contacts are usually with State Experiment Station workers and naturally so, rather than with Extension workers. Often a trip to a State or to some section of a State is for a very specific purpose; the Division's representative is in need of haste; contact with a research man in the Experiment Station gives him the needed assistance; he does his work, perhaps at a particular place or at most in only a small number of places, and rapidly goes to his next place of observation or research. Under such conditions, delays incident to making an appointment with a county agent would often cause inconvenience with no compensating advantage.

However, when circumstances permit, mutual helpfulness and courtesy seem to suggest as a general principle the making of contacts with county agents and other State representatives interested in the specialty being served, and particularly in matters having to do with horticultural crop production, but this general principle should be accepted and applied with reason by both State and Division representatives.

PUBLICATIONS

Until an investigator publishes his results he is very much like a man winking at a pretty girl in the dark; he knows what he is doing but nobody else does. No research job is complete until the findings are made available to those who need and can use them. The manner in which the results are published reflects not only upon the investigator but upon the Division, hence the vital importance of checking manuscripts before they leave the writer's hands to be certain that statements of fact are really such, that technical terminology is accurate, and that the computations and citations are correctly stated. In addition to the section leader, the manuscript should be reviewed by at least one person generally familiar with the work involved.

The writer, and his secretary-typist, can do much to speed the manuscript on its way to the printer by making sure that preliminary editorial matters are looked after. There are many styles of printing that are sanctioned by good usage, but in an establishment as large as the Government Printing Office, with work being handled by many different persons, definite rules of style are necessary. These may be found in the Style Manual, an excellent abridged edition of which is sold for 20 cents by the Superintendent of Documents, Government Printing Office, Washington, D. C. "Suggestions to Authors of Papers Submitted for Publication by the United States Geological Survey," containing many helpful suggestions for writers, sells for 15 cents. Webster's New International Dictionary is followed as to spelling, etc., except as noted in the Style Manual.

All manuscripts should be typed on 8x10-1/2 sheets, one side only, with a margin of about an inch all around. Double space all matter, even legends, footnotes, and literature citations. Begin and end all pages with a paragraph, as the material is distributed among several typesetters at the Government Printing Office. Don't worry if this leaves blank space on some pages! Tables, too, should be typed on separate sheets, as they are handled separately from the general text at the Printing Office. An original and one carbon copy are needed for all manuscripts for Department publication, with an extra list of illustrations showing number and location of negatives used so that these may be obtained promptly if extra prints are needed. (Negatives of published material should be sent to the Photographic Section for filing.) In returning proof, be sure to initial it. Every now and then we get back proof, corrected, but with nothing to show who made the corrections or that the writer has seen the proof.

An original and two carbon copies are needed of manuscripts intended for publication in outside journals, and such papers should be headed: U.S. DEPARTMENT OF AGRICULTURE, Bureau of Plant Industry. Spraying Pecans or whatever the title may be. By John Doe, assistant pathologist, Division of Fruit and Vegetable Crops and Diseases. This is necessary for proper identification and credit. Since such papers are usually furnished without charge, the publisher should be asked to supply you free with any reprints needed.

DISTRIBUTION OF PUBLICATIONS

Employees can usually save time by writing direct to the issuing office (Office of Information, Bureau of Standards, State station, etc.) for publications needed, rather than by asking the Business Office to obtain them. In general, however, orders for Department publications are sent to the Bureau's Office of Publications (Mr. James M. Pickens). Where less than 8 publications, any kind, are ordered, an ordinary franked and addressed manila bulletin envelope (about 7x10-1/2 inches) should be used, the series and number of the bulletins and copies of each desired being written on the inside of the flap of the envelope, which should also bear the name of the Division and the initials of the person ordering the bulletins so that the envelope may be returned to him promptly in case some of the publications are no longer available.

Where 8 or more publications are needed, an addressed ungummed frank and order form (Form 75, white, for Farmers' Bulletins and Leaflets; and Form 74, blue, for all other publications) should be furnished. The frank must have the name of the Division stamped on its back, whereas the order form has the name of the Division on the front along with the initials of the person ordering the publications. So far as practicable, check to see that the publications are actually available before sending in your order. It is useless, for example, to send in an order for Bureau of Plant Industry Bulletins or Circulars, Department Circulars (this is the old series; the present series is called Circulars, not Department Circulars), or Department Bulletins, as they are no longer available (with very few exceptions) unless copies may be in the hands of the author or the issuing bureau or office. Reprints of Journal of Agricultural Research papers are available only from the author (or from the Superintendent of Documents, Government Printing Office, Washington, D.C., at 5 cents each).

The maximum number of copies of a publication that may be sent to one Washington, D.C., address is 50; more may be sent to field stations or collaborators, but where more than 25 copies are ordered, attach a statement showing the need for them. Where publications are being sent out at the request of a Member of Congress, use the 5x8 Congressional order form so that the Office of Information may charge the bulletins to the Congressman's quota.

With foreign addresses, orders are prepared on Form 81 (original) and 81-a (duplicate), both copies being sent to our Section of Supplies, which will arrange for postage. Use the 4x5 foreign frank. Where more publications are being sent than will go in an ordinary bulletin envelope, or where the package will exceed the weight limit for the country concerned (see Postal Guide), additional addressed franks must be supplied. If the publications can be supplied by the Office of Information they need not accompany the order; otherwise they should be sent with it, the order bearing the notation "herewith" typed below the title of the publication. Where the same bulletin is being sent to a number of persons (foreign or domestic) but one order form is necessary, bearing the notation: "To the _____ persons whose names and addresses are given on the accompanying franks (or envelopes)."

DEEDS--NOT WORDS

A good many employees are rated less than "Excellent" for the reason that they are careless and indifferent in their work; not because they are lacking in intelligence or ability. Logically, of course, when you do your work in an absolutely satisfactory manner you are merely earning your present salary. To deserve a higher rating and increased salary, you must, in these days of keen competition, expect to do a good bit more than you are being paid to do. Deeds, not words--for actions speak a whole lot louder than words in this competition. It may be, indeed, that your own office hasn't the money to give you an increase in salary. The solution appears to be to make your light shine so that it reaches out beyond the limits of your own section. In time good work is almost certain to be rewarded--by your own office, or by a more discerning employer elsewhere.

The eagerness with which the average administrative officer seeks to unload some of the mass of routine that piles high on his desk is almost pathetic. He is anxious to delegate authority. To get a job done, he must always find a worker to do it. Fit yourself to be that worker and sooner or later the opportunity will come. Sometimes, it is true, your immediate superior may not seem to be sufficiently appreciative of your efforts, but you must remember that every person who occupies a responsible position has things to occupy his mind and to worry about that may seem to make him at times unconscious of the good work of his subordinates. He isn't, because the success of any executive hinges to a surprising degree upon the efficiency of his subordinates.

The administrative officer is usually in a better position than you are to determine your value in comparison with the work of other employees in the same or approximately the same grades. Usually the promotion that is attributed to "luck" or "chance" has a solid reason back of it. Injustices are done, but as a rule the employee who lands the promotion has earned it. Individuals in the different sections are not in a position to know very accurately the value of the services of workers in other sections, but the administrative officer has access to all the information available concerning the worker's background and efficiency.

So, when you turn over that new leaf on January 1, remember to write down that, when you enter an office you should make up your mind that you are going to work for your employer's interests as you would for your own, says Office Practice. In the long run the success of your superior officers means success for you also. Don't be a shirker. Often it actually takes less time to do a thing well than to avoid doing it. It is sometimes said that the reason so many employees receive \$5.00 a day or less is because it is necessary to employ a \$10-a-day worker to tell them what to do and make sure that they do it. Quite often our jobs are what we make them, and if we manifestly outgrow our immediate position by increasing our efficiency, the wider field of opportunity and the better salary is apt to be "just around the corner!"

Vol. 11 No. 1

January 1, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI

Washington, D.C., January 15, 1939

No. 2

Annual Report

"That the long-time research program of the Bureau of Plant Industry is fundamentally sound in its philosophy and major objectives has been amply demonstrated in recent years, during which the Bureau has been able to supply abundant basic information on field and horticultural crops that is essential to the formulation and prosecution of various governmental action programs," says Dr. Auchter in his first report as Chief of Bureau, released January 4, 1939.

"While maintained on a high plane of scientific procedure, the plant-research program has at the same time been flexible enough to permit advisable shifts in emphasis in order to meet most immediately pressing problems. In this connection it should be pointed out that the greater value of plant research lies in the accumulation of results through years of patient study of problems involving infinite detail. It is from the rich background of long-continued experimentation that the solution of an immediate problem is most likely to evolve, although the chance of making a notable discovery, even in an unexpectedly short time, is always present. Continuity in research of this character affords, nevertheless, the greatest assurance of effectiveness. For this reason, plant research must retain always the long view and avoid aberrant shifts in procedure."

Perhaps the best illustration of the manner in which the Division has met its responsibilities in connection with this program is the fact that during the fiscal year ended June 30, 1938, we put out nearly 200 printed publications, counting papers published in outside journals and those issued in the various Department series. Printed publications are issued in response to an active demand not to be met adequately by the use of informal mimeographed circulars of information; they meet a real need and offer convincing proof that our specialists are sensible to the all-important fact that research findings are comparatively valueless until they are placed at the disposal of those who need and can use them effectively.

It is a source of extreme gratification that our specialists contributed the bulk of the papers, nearly two dozen, to one of the most popular Government publications of recent years--the 1937 Yearbook of the Department. This volume is sure to be a valuable reference book in the libraries of those interested in agricultural development for many years to come. More than 100 papers were contributed to outside publications. This is not only a very satisfactory method of getting information into the hands of those interested, but it also builds up a friendly cooperative spirit among publishers of agricultural and scientific publications, who welcome our contributions. For example, 78 papers by our specialists were accepted for the programs of the various organizations meeting with the American Association for the Advancement of Science at Richmond, December 27-31, 1938'.

The Chief of Bureau's report summarizes some of the highlights of our work during the Fiscal Year.

NEW PEACHES REQUIRE LESS COLD TO BREAK REST PERIOD

In southern peach-producing regions the winter cold may sometimes be insufficient to cause normal breaking of the rest period of certain commercial varieties, resulting in delayed and irregular development of blossoms and leaves. Crosses with two peach introductions from South Africa have produced hybrid varieties that require distinctly less cold to break the winter rest period, giving promise of obtaining ultimately varieties better adapted for growing in regions where mild winters occur. Too, a number of chemicals have been used as sprays in the study of methods of breaking the rest period, and there is a prospect that some of these may be used effectively in regulating the breaking of winter dormancy and the time of blooming of peach varieties.

HARDY FRUIT VARIETIES ADAPTED TO HIGH ALTITUDES

Definite progress has been made in finding hardy fruit varieties adapted for growing at high altitudes under the severe climatic conditions of the central Great Plains area. Several varieties of grapes, for example, have proved to be early enough to ripen fruit; the Red Lake variety of currant has been outstanding in all tests; and the Chief raspberry seems to be the hardiest and uniformly outyields all other raspberries in the northern part of this area. The first fruiting of plum test plantings indicates some promising varieties. Since we have found no commercial strawberry sufficiently hardy for our needs, we are crossing the most promising commercial types with hardy native species in the hope of obtaining satisfactory hardy varieties.

In all of the fruit testing in this project the purpose is to assemble promising stocks both of horticultural varieties and of hardy native species, and to use these in selection and breeding work to develop new varieties especially adapted for culture in the region.

VEGETABLE INVESTIGATIONS

The News Letter has told you of the release to seed growers and investigators of small quantities of the new lima bean variety, Baby Fordhook. This is a new type of small, thick-seeded lima, of bush habit, comparable with Henderson bush lima in season and yield, but more attractive and of better quality. We have a head lettuce, Imperial 44, that appears well adapted for growing in New York--so much so that the insistent demand of those who have tested it caused us to release it a trifle sooner than we had planned. It has given good results in small trials in other Eastern States as well, though in the Pacific coast region, where the strain was originated, it usually makes heads too small to meet market standards.

NEW TOMATO HYBRIDS NEARLY IMMUNE TO FUSARIUM WILT

Several lines of the small Currant tomato are apparently immune to fusarium wilt. When crossed with standard tomato varieties they have given hybrid progenies that are more highly resistant to fusarium wilt than varieties previously developed. First- and second-generation hybrids between Currant and 100-percent susceptible Bonny Best show almost complete immunity. Some of the hybrids between Currant and resistant Marglobe backcrossed twice to Marglobe seem to be satisfactory in production and size of fruit as well as in wilt resistance.

NEW SWEETPOTATO VARIETIES PROMISING FOR STARCH PRODUCTION

In view of the rather amazing progress being made in the production of starch from sweetpotatoes, it is interesting to know that two new seedling sweetpotato varieties selected from populations grown from open-pollinated seed obtained in Cuba are attracting much attention for their probable value in starch manufacture. They yield heavily and have high starch content and remarkably white flesh. Commercial quantities of these varieties have been grown only in the vicinity of Laurel, Miss. in connection with experiments in starch production.

POTATOES

Two new potato seedlings have continued to yield well in trials in a number of locations. They have been named Sebago and Earlane, and seed stock has been increased for distribution. Sebago is resistant to late blight in both vines and tuber. Earlane is as early as Irish Cobbler and produces tubers with higher market quality. Among previous introductions, Katahdin and Chippewa are increasing in popularity each year, and Houma is attracting considerable attention from potato growers in several States. From recent crosses seedlings have been obtained that combine resistance to several diseases with high yield and superior quality, and the prospect is that a number of these will attain variety status in the next few years.

KATAHDIN POTATO RESISTANT TO MILD MOSAIC

Attempted experimental infection of the Katahdin potato with mild mosaic virus shows that the infective aphids during feeding actually contact the phloem tissue of this variety with the same frequency as other varieties that contract the disease. It is in phloem that the virus spreads. The resistance of Katahdin to mild mosaic therefore seems to depend on some inherent inhibitory property of the plant substance rather than on a more or less accidental failure of the virus to reach the exact tissues that are affected in ordinary varieties. This finding increases confidence in the ability of Katahdin to resist the aphid-borne mild mosaic under general field exposure. In the breeding work it has been found that mild mosaic resistance of the parent lines is transmitted to the great majority of their progeny.

HANDLING, TRANSPORTATION, ETC.

Not only are we developing new and superior sorts--we are showing how to handle the older ones to better advantage--as indicated by our demonstration that the Bartlett pear storage period may be prolonged by a carbon dioxide treatment. It has been found that when Bartlett pears are exposed to atmospheres of 20-percent carbon dioxide gas for 10 days under simulated transit conditions their ripening processes are greatly delayed when they are held subsequently in cold storage.

Storage scald of limes, too, has been prevented by temperature control. Such scald of Florida-grown Persian limes was severe at 41°F., but practically negligible at 45° and 48°.

Even more important was the demonstration that proper loading will reduce injury to potatoes in transit. Freezing of potatoes in winter shipments from northern points is partly due to loading the potatoes only slightly above the freezing point and to the entrance of very cold air into the car while loading. The use of sacks 2 inches shorter and correspondingly wider gives an air space of about 3 inches between the load and the car wall, which prevents direct conduction of heat from the potatoes through the car walls and also prevents chafing of the sacks. A 16-inch electric fan insures more effective preheating of the loaded car and reduces the required time from about 18 to 3 hours. Satisfactory results have been obtained in adapting a portable thermostatically controlled charcoal heater and a permanently installed underslung gas heating system for protection of potato shipments.

Investigations of injuries to potatoes loaded next to the car floor show that the primary cause is usually bruising against the floor as a result of load pressure and car movement.

DECIDUOUS FRUIT INVESTIGATIONS

H. F. Bergman, Amherst, Mass.

"The last examination for spoilage in stored cranberries from experimental spray plots was completed the week ending December 3. This was one of the seasons in which losses due to spoilage caused by fungous rots was very high. This season has been as bad as that of 1935. The May and June temperatures of this year while not as high as in some other years were yet above the average and the number of rainy days in July and August was large and high temperatures prevailed during that period also. Seasons such as this make spraying experiments show up poorly as even on some of the sprayed plots the spoilage due to fungous rots runs up to 30 to 40 percent. The loss in unsprayed plots runs up to 75 to 90 percent. It is, however, only on a few of the bogs where keeping quality is always poor that these very high losses have occurred this year.

"Among the sprays tested this year bordeaux 5-2-50 with rosin fish oil soap has reduced the rot to one-half to one-third of that in the checks or in a few instances has done somewhat better. Other adjuvants such as penetrol, or sodium salts of sulphonated diphenyl compounds do equally well with bordeaux. Red copper oxide (Cuproside) with bentonite has also controlled rots almost as well as bordeaux. Cuproside with lethane spreader and soluble cottonseed oil which is so successful with blue mold of tobacco gives very little or no control of cranberry fruit rots.

"The best control of fruit rots by any spray used was obtained with a modified bordeaux which contained some zinc arsenite. Four different formulae of bordeaux with zinc arsenite (two of the four also with monocalcium arsenite) were tested on a few small plots on the State Bog. One of these four, which contained zinc arsenite only added to the bordeaux, reduced the rot much more than the regular bordeaux. It appears that some of these formulae will be worthy of further tests."

Geo. F. Waldo, Corvallis, Oreg.

"During the past month activities have been largely centered around the study of the strawberry breeding carried on at this station," he writes December 21. "Since 1910 strawberry breeding has been carried on by Mr. Ray Roberts and V. R. Gardener, C. E. Schuster and Dr. George M. Darrow and myself. The greater portion of the work was begun in 1928 by Mr. C. E. Schuster, and since that time over 100,000 strawberry seedlings have been fruited and about 1600 selections made. Many crosses have been made where a large number of varieties and selections of former breeding work have been used as parents. The objectives of the workers have at times changed so that selections have been made for a large number of purposes. At the present time there are a large number of selections having various qualities that may be used in future breeding work."

DECIDUOUS FRUIT INVESTIGATIONS

J. R. Kienholz, Hood River, Oreg.

"Data for pear scab plots were completed December 1. Two checks or unsprayed plots showed 32.5 percent scab. Kolofog gave poorest control, with 8.3 percent scab. Other materials used varied from 0.6 to 3.4 percent scab in the plots. All plots had approximately 100 percent russeted fruit except copper phosphate which had 78.5 percent total russet.....

"In a commercial test more outstanding results were obtained. Check tree dropped all fruits so no direct comparison is available. However, copper phosphate showed 0.3 percent commercial russet, wettable sulphur 40.6, and a lime-sulphur combination 64.8 percent. Even during years where unusual amounts of russet have resulted, copper phosphate had been the best spray used. This relation has obtained now for a period of six years....

"Drought Spot and Corky Core on Yellow Newtown Apples--Twelve check trees showing drought spot in 1937 (average 32.9 percent drought spot) showed 34.8 percent in 1938.

"Thirteen trees showing an average of 25 percent in 1937 were treated with 1 or 1-1/2 pounds of borax in April. Not a single apple showed drought spot or corky core in 1938. These trees were about 30 years old. The trouble was also corrected on a block of young trees by boron application.

"The quality and appearance of Spitzenburg apples were greatly improved by boron applications. Certain cover crops were greatly benefitted also."

John H. Weinberger, Fort Valley, Ga.

"Temperature records obtained at the Laboratory show that we have had 338 hours of temperatures below 45°F. to date," he writes December 12.

"This is about 200 hours short of last year, and about 10 percent more than the 17-year average for the period, compiled by Dr. Hutchins. Growers who call up to inquire about hours of cold feel quite optimistic."

In his report for the first week in January, he says: "Up to January 2 we have had 596 hours of temperatures below 45° F., 112 having been added this past week-- December 26 to January 2. The normal for January 1st is 488 hours. Requests for this information are being received almost daily from local fruit growers!"

NUT INVESTIGATIONS

George F. Potter, Bogalusa, La. (Tung Investigations)

"All members of the staff attended the Science Meetings in Richmond, Va., with the exception of Dr. McCann, who continued to work on the fruit bud development problems," he writes January 5.

"The immediate object has been to find a method by which the stage of development of the buds could be estimated from a study of fresh material. It was hoped that it would be possible to make cross or longitudinal sections in which the size of the female flowers might be measured. However, it has been found that the female flowers can be located only by a tedious process of dissection under a wide field binocular microscope. Each flower must be individually opened, there being no distinctive difference in the external appearance.

"The material used for this study was taken from two trees, in one of which the number of flowers ranged from 12 to 47 per bud, with an average of about 24. The ratio of pistillate to staminate flowers was 1 to 29. The second tree had an average of more than 38 flowers per bud and a ratio of 1 pistillate to 18 staminate blossoms."

He had written early in December: "Two rather low temperatures occurred during the last week of November. At Poplarville, Miss. 25°F. was recorded on November 25, and 24°F. on November 28. The foliage, which up to this time had remained green on many of the most vigorous tung trees, was killed, but so far as has been observed to date no harm was done either to mature trees or seedlings in the nursery.

"However, during the week ending December 10 some very interesting observations were made on budded stock in the Crosby nursery, near the Mississippi State Cooperative Tung Farm. These trees had been budded at weekly intervals beginning July 25, and on the first four lots the stocks were cut off, three to four weeks after budding, to force out the buds.

"The tips of the new shoots suffered even in those lots that had been budded earliest, and the entire shoot was killed on those cut off in mid- and late September. Apparently the reduction in leaf area, incident to cutting off the stock, prevents these trees from hardening. Dormant T-buds inserted after September 15, also showed a high mortality. Late patch buds withstood the freeze much better.

"Samples of these buds have been preserved for histological study."

NUT INVESTIGATIONS

John R. Cole, Albany, Ga.

Writing from the U. S. Pecan Disease Field Laboratory on December 10th he said: "The title of this report might easily read 'The Taylor Orchard Has Done it Again'." We have completed our harvest in this orchard and the total production from approximately 12 acres was 6,200 pounds. This compares with 7,700 pounds for the 1937 season.....

"Of course this is an experimental and not a demonstration orchard. The yield from our best Schley, 3-1-50 bordeaux mixture, was 37 pounds per tree, while the unsprayed, or check only averaged 15 pounds.

"This yield of 6,200 pounds far exceeded our expectations. We were estimating not more than 5,000 pounds. This is especially favorable, too, since the season of 1938 had the greatest rainfall deficiency on record. The nuts were small but of very fine quality.

"It appears that we have 'licked' what has been known as the 'biennial bearing' of pecans. It is true that trees, regardless of varieties, do not bear heavy crops annually, but they should at least make expenses annually, and a profit biennially. For example, one Schley tree that produced 102 pounds in 1937 had 45 pounds in 1938. This tree received the same treatment both years. Other trees, not only of the Schley but of other varieties as well, have produced in the same proportion in the Taylor orchard during the past four years."

Paul W. Miller, Corvallis, Oreg.

"The forepart of the week ending December 17 was spent in the field at Dundee, Oreg., taking results of studies on spraying for the control of filbert blight in the nursery. The results of this test indicate that timely spraying with bordeaux mixture will aid in the control of filbert blight in the nursery. Not a single blight canker was found on the trees examined from the sprayed plots, whereas about 2 percent of the trees examined from the unsprayed plot contained blight cankers on the trunks.

"While the results would have been more outstanding had the incidence of the disease in the nonsprayed plot been greater, they are, nevertheless, encouraging, as they indicate that it may be possible by a combined excision and spraying program to, in time, control filbert blight in a nursery, thereby automatically controlling filbert blight in future plantings since most, if not all, infection in the orchard apparently originates in the nursery and is brought into plantings on diseased nursery stock, from whence it is subsequently spread by man on tools and by rain."

NUT INVESTIGATIONS

C. E. Schuster, Corvallis, Oreg.

"A couple of days (December 8 and 9) were spent at the meetings of the Oregon State Horticultural Society and the Western Nut Growers Association at Eugene, Oreg. A good attendance was on hand. The feeling of the nut growers was really better than a year ago. The filbert crop has been sold out completely at good prices. Filberts are not even available in local markets for people that want to ship filberts out as Christmas presents.

"The walnut prices have been good, although the sales are not anywhere near as good as with filberts. The walnut crop in Oregon has run so high over the estimate of the associations and also the Government reporting system that their pre-season sales will not cover their crop at all. They turned down a good many orders with the idea that their crop was sold, and now they have a good many hundred tons left to dispose of."

Max B. Hardy, Albany, Ga.

Writing from the U. S. Pecan Field Station and Laboratory on December 17th, he said: "We have had a large crew of laborers busy knocking shucks off the trees and raking shucks and leaves into piles preparatory to hauling to the compost pile.

"The results of this work last year in controlling shuckworm were so satisfactory that the owner of the orchard is paying the labor charges this year. He is also treating one of his personally-managed orchards in a similar manner and his results will be closely watched. He did not have the ground clean enough to allow proper raking and he is burning the piles of leaves and shucks, factors that will make observation of his results even more interesting."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Geo. P. Hoffman (vegetable crop investigations)

"In company with Dr. Lutz, a trip was made to the Laurel Starch Plant," he writes December 17th. "From what was observed and reports obtained, the season has been a very satisfactory one. Approximately 175,000 bushels of sweetpotatoes have been handled and milled into starch. Delayed harvest in handling and receiving potatoes for immediate milling at the Starch Plant was reported as having been very successful this season, with the season closing about December 15.

(continued)

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Geo. P. Hoffman (continued)

"Disposal of the starch and the solids of the ground sweetpotato remaining after removal of the starch--the latter being in demand as a dairy feed--was reported as being satisfactory.

"A considerable quantity (about 4,000 bushels) of late-harvested potatoes was observed in storage in an improvised concrete wall and roof house for use in dehydration studies in which lot the percentage of soft rot was rather high. Consequently, it remains to be seen how long delayed harvested potatoes can be held between harvest and milling for starch."

HANDLING, TRANSPORTATION AND STORAGE AND MARKET DISEASE INVESTIGATION

The Greeks have And it's a good word, too, speaking of Circular 278,
a Word for it! "The Commercial Storage of Fruits and Vegetables and
 Florists' Stocks," by Dean H. Rose, R. C. Wright and
T. H. Whiteman of Mr. D. F. Fisher's section.

We have recently had a request from Greece for permission to re-publish this circular in Greek, for public distribution to acquaint the growers of that country with the important advances being made in connection with the commercial storage of horticultural products.

Permission to print the Circular in the Greek language has been given, of course, and so this publication now joins the growing list of our bulletins reprinted in full or in part in foreign languages.

ADMINISTRATIVE NOTE

Military A recent decision from the Comptroller's Office (No. A-99707)
Leave states definitely that employees serving under w.a.e. (when
 actually employed) appointments, even though their services
are required at regular periods, are not entitled to military leave.

Manuscripts Please make sure that all manuscripts, and especially those
 intended for outside publication, are headed "UNITED STATES
DEPARTMENT OF AGRICULTURE, Bureau of Plant Industry. Title _____
Author _____ His official title _____, Division of Fruit and
Vegetable Crops and Diseases." This information is frequently necessary
for identification and credit. Quite often papers come to us with nothing
to indicate the writer's connection with our Division! Also proof comes
back now and then, O.K'd, but not initialed to show who did the correcting.

PERSONAL MENTION

Dr. Lee M. Hutchins has spent several days in Washington, D. C. and at the U. S. Horticultural Station, Beltsville, Md., conferring with members of the staff in connection with his investigations. He is returning to his headquarters at Brownwood, Tex., stopping at a number of experimental tracts in the Southeast en route.

Dr. W. W. Aldrich has returned to the U. S. Experiment Date Garden, Indio, Calif., after a short visit to Washington and Beltsville.

W. C. Edmundson of the Potato Experiment Station at Greeley, Colo. was also a recent visitor, this being his first trip to Washington for 8 years. He found a number of striking changes in Washington, of course, and was enthusiastic over the development of the Horticultural Station at Beltsville, Md.

C. O. Bratley, with headquarters at the Market Pathology Laboratory, New York City, is spending several weeks in Florida--while on vacation! Thus he will take a "postman's holiday" by checking up on several problems in connection with his work on the market diseases of fruits and vegetables--especially on the condition of such products as they are received on the New York City markets.

His many friends will be saddened to learn that Dr. Ivan Jagger (Box 150, La Jolla, Calif.) is quite ill. He is slowly climbing back to good health, but his physicians are insisting that he take at least two or three months to recuperate.

Dr. E. L. McClerg has been transferred to us from the Division of Sugar Plant Investigations of the Bureau of Plant Industry, and will take up the work of potato breeding in the south, with headquarters at the University of Louisiana.

Incidentally, the Division has been successful in obtaining space in the Post Office Building at Bogalusa, La., to be used as headquarters for the newly initiated work on the tung.

Samuel A. Morrell has been appointed associated chemist at the U. S. Regional Vegetable Breeding Laboratory, Charleston, South Carolina.

The annual meeting of the cooperators in the 13 southeastern States will be held at the Charleston station January 16 and 17.

Henry O. Bennett has been appointed as agent, with headquarters at the New York Agricultural Experiment Station, Geneva, New York, to assist in fruit breeding work.

Vol. 11 No. 2

January 15, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES
SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

SEMIMONTHLY NEWS LETTER.

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI

Washington, D. C., February 1, 1939

No. 3

Drying . . . "The extensive cultivation of the sweetpotato in the
Sweetpotatoes United States, its high food value, and the considerable
portion of the crop that is annually lost through absence
of means for its preservation are sufficient justification of rather
thorough investigation of possible means for more effective utilization
of the crop, either by direct manufacture into food products or as raw
material for industrial purposes," says Circular No. 499 from our section
of Fruit and Vegetable Utilization Studies. The authors are Joseph S.
Caldwell, Hubert H. Moon and Charles W. Culpepper, the exact title of the
publication being "A Comparative Study of Suitability for Drying Purposes
in Forty Varieties of Sweetpotato."

The circular describes a method of drying sweetpotatoes in slices
or strips which may subsequently be prepared for the table in a consider-
able variety of ways. In outline, the method consists in careful inspec-
tion of the stock to eliminate decayed roots, then peeling by abrasive
machine or by immersion in hot lye solution of appropriate strength, wash-
ing and trimming, slicing or cutting into longitudinal strips by hand or
machine, immersing in dilute citric acid solution to prevent darkening,
spreading on trays, exposing to live steam for a sufficient period to
rather completely cook the material, and drying at a temperature ranging
between 130° and 165° F. to a residual moisture content of 12 to 15 per-
cent.

"Sweetpotatoes may be dried directly from the field as dug," says
the circular, "or after previous curing and storage; the products made
from cured and uncured stock of the same variety will differ considerably
in sweetness, depth of color, and firmness of texture when prepared for
the table and will require slightly different treatment in cooking, but
will be of like quality."

FRUIT AND VEGETABLE UTILIZATION STUDIES

When dried by the method described, the sweetpotatoe material had a semi-transparent or translucent appearance, a greatly intensified and deepened color as compared with the fresh raw sweetpotato, and a smooth, varnish-like surface caused by the presence of a film of dry dextrine and sugars. At a residual moisture content of from 12 to 15 percent the pieces were hard, hornlike, broke with a glasslike fracture under pressure, were not hygroscopic, and did not lose or gain in weight appreciably when stored for long periods with access of air.

"The material was very readily refreshed in preparation for cooking by soaking in cold water or preferably, by placing in hot water and holding at simmering temperature for 1 to 1-1/2 hours. After being refreshed, it could be prepared for the table as baked or candied sweetpotato, or as a mashed or pulped baked sweetpotato, or it could be pulped and employed in the making of pies or prepared as French fried or sauteed sweetpotato.

"The fact that the slices or strips could be prepared for use in a variety of ways made their preparation preferable to that of a granulated or riced product, which was also successfully prepared. The preparation of the riced product was more laborious and control of discoloration considerably more difficult; the product was rather strongly hygroscopic and required protection against access of air to prevent spoilage; It could be used only in a limited number of ways. It is consequently considered less useful than the other forms of product.

"The dry material in sliced or strip form is not hygroscopic and does not require moisture-proof containers for storage. If dried to a proper moisture content and stored in storage rooms in which temperature and moisture content of the air are reasonably well controlled, the material may be kept for years without deterioration in appearance or table quality. It is not attractive to the ordinary insects attacking dried fruits, but is rather highly so to some of the small grain weevils and cigarette or drug-store beetles, so that containers used for packing and storage must be such as will effectively exclude these insects."

About 70 varieties, subvarieties and strains of sweetpotato were studied, the circular reporting in some detail on 40, the studies being continued over a number of years to eliminate variations in raw material due to seasonal conditions or other uncontrolled factors. Nancy Hall, Myers' Early, Mullihan, and Mameyita were somewhat superior in quality of product to all others, but were closely followed by a second group made up of Big Stem Jersey, Yellow Jersey, Porto Rico, Yellow Strasburg, and Red Bermuda. In all some 24 varieties were rated "superior" to "good" in quality when dried, with 18 offering a rather wide range of material to which use for drying should be confined on the basis of our present knowledge.

SUBTROPICAL FRUIT PRODUCTION

Harold F. Yates, Fairhope, Ala.

"The Satsuma orange crop along the Gulf Coast was very satisfactory during the past fall from the standpoint of both yield and quality," he writes from the Alabama Gulf Coast Substation. "Although the trees were subjected to unusually low temperatures during the winter of 1937-1938, the minimum being round 16°F., there were no freezes immediately following a period of high temperatures. There was therefore little defoliation and the trees went into the spring of 1938 in good shape. This resulted in a heavy early bloom that set well. There was almost no late bloom. Another contributing factor to high quality was the unusually dry season, with rainfall of little more than 50 percent normal. These conditions resulted in a heavy crop of small fruit of unusually good quality where satisfactory spray schedules were followed. Fertilizer and cultural practices of course affected the yield but had very little if any noticeable effect on eating quality.

"However, the price in general was somewhat lower than normal, especially on low quality fruit. This may be due to several conditions, but is no doubt influenced largely by there being insufficient Satsumas on the markets in preceding years to supply the demand that was created several years ago when there were more trees in bearing and correspondingly more fruit sold. Experience indicates that where fruits were marketed one year we may expect a much heavier demand during the next season.

"Yields on the Gulf Coast Substation experimental plots for 1938 showed about 150 percent increase over yields from the same trees in 1937. The same proportionate increase probably existed throughout the Gulf Coast area. With normal temperatures continuing during the present winter we may expect some increase in next year's crop, but not as high a percentage increase as in the 1938 crop over that of 1937.

"Good yields in general on all Satsuma experimental plots enabled us to obtain the most valuable and complete records we have obtained so far on varieties and rootstocks. Of the newer varieties on trial the most outstanding one appears to be the Kashima. In previous years it has seemed to be somewhat hardier than any of the other varieties and this year it led all others in yield, quality, uniformity of ripening, and ability to color up on the tree. The newer varieties as a whole, if left on the tree, reach the peak of their eating quality while still somewhat green, necessitating degreening if they are to be marketed.

"The Satsuma ripening period was 10 days to 2 weeks earlier this year than last. Some of the early maturing varieties were ripe as early as September 3, while the final harvest on some of the later maturing varieties was made on November 12."

HANDLING, TRANSPORTATION AND STORAGE, AND MARKET DISEASE INVESTIGATIONS.

W. T. Pentzer, Fresno, Calif.

"The activities at the Fresno station during the past two months have been those occasioned by periodical inspection of storage lots of grapes and pears and work on reports and manuscripts," he writes on January 10th.

"In grape storage studies this season, particular attention is being given to re-fumigation in storage with sulphur dioxide, a question of considerable importance to both grower and cold storage operators judging from the number of inquiries received. So far, frequent light fumigations have held mold in check more effectively than heavier concentrations applied less frequently.

"The Commercial grape storage season is drawing to a close, with perhaps about 1/4 of the storage grapes yet to be moved from storage. Neither prices nor keeping quality have been so good as last year. Killing frosts on the morning of November 12, 13, and 14 damaged a considerable quantity of Emperor grapes still on the vine. Temperatures as low as 24° to 25° F. were reported in some sections, with virtually all districts experiencing freezing temperatures long enough to injure both stems and berries.

"An attempt was made by some growers to pack the best of the frozen fruit and ship it to eastern markets, despite county regulations against shipping frost damaged fruit. The result in most cases was disastrous, the grapes bringing less than the cost of freight. If the freeze had occurred only 10 days later, practically all of the grape crop could have been harvested. Instead, it is estimated that about 500 cars of grapes were lost by the early frosts in November.

"Storage inspections for Hardy pears have been completed. Last season, because of the large crop of this variety, picking extended over a period of 7 to 8 weeks in some orchards. There was some concern expressed regarding the keeping quality of the late picked fruit. In the first five pickings, extending from 110 to 150 days after full bloom, no storage troubles were encountered. The best dessert quality was encountered in lots picked 130 to 150 days after full bloom in a pressure test range of 9.7 to 8.0 pounds. Fruit remaining on the tree until September 13 or longer, that is, 160 days or more after full bloom, developed considerable breakdown during a short storage period.

These preliminary results suggest the desirability of beginning harvesting about 130 days after full bloom and completing it within about three weeks if highest dessert and storage quality is to be obtained.

DECIDUOUS FRUIT INVESTIGATIONSM. A. Smith, Columbia, Mo.

Writing from the Fruit Disease Laboratory on January 4th, he says: "Reports received on January 3 from orchardists in the Ozarks indicated that apple and peach fruit buds were unusually far advanced. Some feared that the crop would be in considerable danger if the unseasonable warmth continued.

"Rainfall was above the normal at Columbia in November and December. Rainfall in the Ozarks was above the normal in November, but was 1.03 inches below the normal in December. Reports indicate that orchard soils in the State are well supplied with moisture.

"A recent survey was made of orchards in the vicinity of Marionville, Springfield, Mountain Grove, Columbia and Waverly, Mo. Of outstanding interest was the great abundance of overwintering scabbed apple leaves that were seen."

J. R. Kienholz, Hood River, Oreg.

"A lot of Yellow Newtown apples showing drought spot or boron deficiency was inoculated with the canker fungi to compare with another lot which received applications of boron and showed none of the trouble," he writes December 31. "A preliminary examination showed slightly greater rot diameter in the boron deficient fruit, but it is believed the greater maturity of the fruit was sufficient to account for the difference. A striking feature of fruit inoculated in a semi-mature state is the occurrence of a yellow zone surrounding the brown rotted area on the Yellow Newtown variety. This zone usually measures from 3 to 7 mm. wide. Since Hartman and others have shown that green fruit ripens faster when placed with ripened apples (because of the liberation of ethylene gas) a question arises as to whether the fungus, when once established, gives off or produces a similar gas which hastens maturity of the green apple immediately surrounding the rot tissue. This same phenomenon has been observed to occur with other rot producing fungi and in the case of storage infection by the pear scab organism.

"The past season was peculiar for fruit development judging from the unusual troubles brought in for examination. Yellow Newton apples were recently received showing an extreme russetting of the skin from the stem end downward. No spray material was responsible for the condition and the trouble appeared only in certain orchards. Its cause is unknown. Fruit from the same orchard often showed a beautiful red cheek which was very unbecoming for the Newtown variety. It is suspected that border-line frost injury at the bloom period, extremely hot weather in early May, and heavy dews during the summer all contributed to the odd troubles."

DECIDUOUS FRUIT INVESTIGATIONS

George F. Waldo, Corvallis, Oreg.

"A brief visit was made to Portland where I observed the cutting of berries at the Northwest Cannery Convention," he reports January 7th. "It was interesting due to the fact that a large proportion of the currings concerned Young and Boysen berries. Judges had difficulty in determining whether canned berries were Boysen or Young. Another outstanding observation was that the majority of the best canned strawberries were of the Redheart variety. The Eppersburg 121 seemed to be decidedly inferior to Redheart. The showing of Evergreen blackberries was, on the whole, very good. Also that of Loganberry and red raspberry. There seems to be a decided improvement in the qualities of these last named products.

John H. Weinberger, Fort Valley, Ga.

Writing from the U. S. Horticultural Field Laboratory on December 19, he says: "The laborers finished applying ethylene dichloride to all peach trees on the grounds except one-year-old seedlings, this week. It is fortunate for our work that a safe chemical treatment for borers on young trees has been found.

"Twigs from five different varieties of peaches were brought into the greenhouse on the 16th and sprayed with various concentrations of dinitrophenol and DNO. Also twigs from about 24 varieties were brought in and sprayed with DNO at .06 percent concentration to study varietal reactions. Six-hundredths percent will probably be the concentration recommended to Mr. Fugazzi for spraying his orchard next month, as tests this fall have shown that this concentration when properly handled is not too dangerous, and is quite effective."

Writing to Dr. Cullinan on January 17th, he adds: "Another application of dormancy-breaking sprays was made yesterday at Albany, Ga. and it was observed that the sprays applied January 2d had caused flower buds on Elberta, Halberta, and possibly Halehaven and Golden Jubilee, to start active development."

Elmer Snyder, Fresno, Calif.

"A number of trips have been made to vineyards to inspect the root systems of weak vinifera vines," he writes January 14th. "Many weak vines on sandy soils were found infested with the rootknot nematode while on the heavier soils phylloxera insects were usually found. The rootstock, Solonis x Othello, No. 1613, is being quite generally planted and young vineyards established on this rootstock several years ago are making excellent growth."

DECIDUOUS FRUIT INVESTIGATIONS

Clarion O. Hesse, Davis, Calif.

"During the past few weeks things have been quite active here," he writes January 11th. "The early season rainfall was sufficient to wet the soil to planting depth, so that planting the Wolfskill farm at Winters was begun as soon as the trees could be taken from the nursery. This was a little later than usual this year, for the nursery stock hold its leaves very late, in many instances up to the middle of December. To date about two-thirds of the proposed planting for this year has been made at the Winters tract. This includes about 1500 Royal apricot trees planted for irrigation and thinning investigations, approximately 250 peach and nectarine varieties, 100 apricot varieties, and 25 almond varieties. Further plantings are being made."

Writing on January 16th he reported: "California, not be outdone by eastern sections, has been enjoying 'June in January' weather for the past week. The most noticeable effect to date is that the early blooming fruits are pushing their buds. P. Mume showed a first bloom January 13, and one or two others are nearly as far along. The earlier almonds are pushing slightly. We are hoping the weather will turn more seasonable, for such an extremely early bloom date would almost certainly mean damage by frost later in the season. In addition, considerably more rain would be welcome."

Lee M. Hutchins (Fruit tree virus diseases)

"The laboratory at Fort Valley, Ga. was a welcome sight to us," he writes Dr. Magness January 22, concerning his field tour, "and we lost no time in proceeding with our winter work there. Trees inoculated in January 1937 with phony root pieces subjected to various time-temperature exposures in hot water were examined. We found a good representative number of these root pieces had survived the treatment and had made successful growth unions with the roots of trees on which they were grafted. The results were entirely in keeping with those previously reported on incubation stage phony nursery trees subjected to hot water dips. The phony disease virus was inactivated in all root pieces treated for 25 minutes or longer at 48°C. In the case of phony disease incubation stage trees, a dip of 40 minutes was required at this temperature to inactivate the virus. No doubt the longer time for trees as compared with root pieces was due to the thickness of bark and wood of large roots and of the root crown. These data furnish very promising possibilities for future work preparatory to formulating a safe commercial practice for treating nursery trees."

DECIDUOUS FRUIT INVESTIGATIONS

W. F. Wight, Palo Alto, Calif.

"The weather continues to be fine for the most part and I think the winter promises to be a mild one with the exception of the disastrous freezes which occurred early in November," he writes Dr. Cullinan on January 14th.

"I have a tree dahlia near my garage that has not yet been frosted and this is one of the plants that usually succumbs about the first of anything. I have also had a peach tree in full bloom on the first of January, and I wonder if there was anywhere in the country another peach tree in bloom so early? Of course Prunus Mume is in flower. This can almost always be expected to be in bloom sometime during January. I presume there are also a few almonds out in extremely favorable situations, although I have not seen any myself.

"In spite of the low prices received for peaches in 1938, farmers still seem inclined to plant more and I have requests not only for the varieties that have already been released but for others, both clings and freestones, that are promising and perhaps should be released in the not very distant future...."

NUT INVESTIGATIONS

A. H. Finch, Tucson, Ariz.

"With the end of the holidays sales it appears that about 75 percent of the pecan crop in Arizona has left the producer," he writes January 10. "Marketing methods are improving each year. During the past season two growers selling groups were organized and a large portion of the nuts sold **through them. This resulted in a more orderly marketing than has been the case when every grower attempted to be his own agent.** The pecans which have not been sold are for the most part held by growers who have not made a serious effort to market them. The carryover from last year was moved at the beginning of the season. Through the forming of stronger groups, too, it has been possible to **extend** the pecan marketing area considerably. Yuma growers in the past have sold individually into the Los Angeles market. For the first time nuts have moved in fairly large quantities into the Denver, Salt Lake and Pacific northwest markets.

"The price paid for pecans has been remarkably constant for the past four years or so. Best quality Success and Burketts have brought 27 to 30 cents per pound to the grower. Western Kincaid and intermediate varieties have brought 15 to 18 cents and Halbert from 11 to 15. The cost of harvesting seems to run around 4 to 5 cents per pound from the nuts on the tree to the graded and sacked product ready for market."

NUT INVESTIGATIONS

Felix S. Lagasse, Gainesville, Fla. (Tung Investigations)

"Very mild weather has prevailed since the first of the year and tung growers are quite concerned about the advanced condition of the buds, as peaches and red bud have been in bloom a week," he writes January 14th. The main harvesting operations at the Bennett place were completed some time ago, but, at present, they are going over the whole orchard again to get what they left in their hurry to get the main crop in, and from what I understand, the gleanings will amount to a considerable tonnage."

John H. Painter, Cairo, Ga. (Tung investigations)

"A visit to the local tung mill disclosed the fact that with some of the very large shippers nuts still not accounted for, there were 60 growers who had produced at least a ton or more of fruit in this locality," he reports January 15. "Twenty-nine towns appeared on the register at the mill."

John R. Cole, Albany, Ga.

Writing from the U. S. Pecan Disease Field Laboratory on January 14 concerning visitors interested in the scab control program he says: "There were approximately 50 growers, in Georgia, that sprayed to control scab last year and indications are that at least 100 will spray this year. There is also a marked increase in 'community spraying'."

C. E. Schuster, Corvallis, Oreg.

"The past two weeks have been exceptionally mild, with very little rain," he reports January 14th, "As a consequence, the early and mid-season varieties of filberts have made very rapid growth. Apparently the Barcelona is ready for pollination with the midseason varieties like the Nottingham freely shedding pollen. Ordinarily we only figure on doing very early pollination work by the middle of January and that has never been successful, according to our records. However, with the development as it is, it is necessary for us to begin our pollination work on the Barcelona. We can expect a wide range of blooming dates this year as it almost inevitable that we will have some colder weather that will slow down the varieties."

Max B. Hardy, Albany, Ga.

"Many visitors have come to the laboratory with questions covering the whole field of pecan growing," he writes January 21. "It appears that north of Albany the main problems are scab and shuckworm control, while in other sections problems of thinning, cultivation and cover cropping as well as fertilization are at least as important as insect and disease control."

THE NORTHSTAR STRAWBERRY

Strawberries are sometimes considered ornamental rather than useful, luxuries rather than necessities, but it is well to remember that in addition to their enticing flavor they are an excellent source of Vitamin C, the food nutrient that helps to insure us against that tired feeling--and too many visits to the dentist. It is estimated, for example, that a 4-ounce serving of strawberries contains as much of the Vitamin C help as a half glass of orange juice.

So-o-o, welcome our latest addition to the Division's list of new named varieties, the Northstar. Dr. George M. Darrow in Circular 517, just issued, "The Northstar Strawberry," tells us that it is being introduced as a second-early, firm, commercial and home-garden variety of high quality and above-average beauty, recommended for trial from Virginia to Oklahoma and northward. It has also been rather promising in trials as far north as Amherst, Mass. and Geneva, N. Y. It is a cross of Howard 17 and Redheart, made at the U. S. Plant Introduction Garden, Glenn Dale, Md. Because it makes a thin matted row and has very large plants, it is easier to raise fancy berries of this than of some other varieties. The berries are about as large as Dorsett and Fairfax, with a flavor somewhat between that of the Dorsett and Blakemore. By many its dessert quality is considered equal to that of Dorsett. Freezing tests have shown the Northstar to be superior to most varieties for the frozen-fruit trade.

ADMINISTRATIVE NOTES

Penal Institutions A copy of Schedules of Products made in Federal Penal and Correctional Institutions has recently been mailed to all section leaders and to our field stations. This lists, among other things, cotton work gloves, shoes, clothing, etc.

It should be pointed out, however, that the inclusion of such items in the schedule does not nullify Department Regulation No. 3342, which prohibits the purchase of articles of a personal nature, unless they are such as the employee could not reasonably be expected to furnish in connection with the performance of the duties of the position to which he was appointed-- or for which his services were engaged.

Therefore, if you find it necessary to purchase articles of a personal nature, be sure to submit with your order, through our Business Office, a detailed statement as to the purpose for which the items are needed.

 ADMINISTRATIVE NOTES

Purchasing from Federal Industries In the News Letter for December 15, 1938, attention was again called to the articles produced by Federal Industries, the requirements for such items to be filled through the Washington office.

Under the Act of June 25, 1938, establishing the National Industries for the Blind, the Procurement Division of the Treasury Department is designated to coordinate purchases by the Federal Government of blind-made products and has issued the first schedule for such products, effective January 1, 1939, listing the following:

Mops, Cotton

| | | | |
|-------------------|---------------------|---------|------|
| Item No. 38-M-162 | 12 lbs. to the doz. | Per dz. | 2.64 |
| Item No. 28-M-165 | 15 lbs. to the doz. | Per dz. | 3.30 |
| Item No. 38-M-170 | 20 lbs. to the doz. | Per dz. | 4.40 |
| Item No. 38-M-175 | 24 lbs. to the doz. | Per dz. | 5.28 |

These prices are f.o.b. point of manufacture for shipment on Government bill of lading.

Accordingly, all purchases of mops must now be made through our Business Office. As other items are added to this Schedule of Blind-Made Products, they will be brought to your attention.

Prohibited Purchases In connection with the specific warning concerning items that must be purchased from Federal Penal and Correctional Institutions, National Industries for the Blind, etc., it appears desirable to emphasize again that there are certain items that must not be purchased in the field, but must be obtained through the Business Office at Washington, D. C. We are reminded of this by the necessity for returning a field voucher covering the purchase of Mazda bulbs, and another that includes a photographic developing tray.

Photographic equipment and electric bulbs and equipment must be obtained through the Washington office, of course. Other items that are not to be purchased in the field include canvas goods (bags, baskets, tarpaulins, etc.); castings; cotton textiles; desk trays; furniture; tires and tubes; ruled notebooks of the type obtainable from the Government Printing Office; and items of a personal nature, such as clothing, aprons and gloves.

Where such items are needed, please remember that the order for them should be placed through the Business Office at Washington.

Vol. 11 No. 3

February 1, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES
SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY NEWS LETTER

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI

Washington, D. C., February 15, 1939

No. 4

Potatoes Circular No. 493, "The Earlainc Potato, A New Early Variety," by C. F. Clark and F. J. Stevenson; and Circular No. 503, "The Sebago Potato, A New Variety Resistant to Late Blight," by F. J. Stevenson and C. F. Clark, are now available and describe two more of our promising potato creations.

The Earlainc (the name derived from a contraction of the words "early" and "Maine") appears to be a valuable addition to the small group of first-early potatoes. Of the many varieties of cultivated potatoes now grown, only a small proportion are early maturing. During the last 2 centuries of potato culture in the United States a considerable number of early-maturing varieties have been produced, but because of low yield, susceptibility to disease and lack of adaptation, most of them have disappeared. It was to supplement those now grown with additional varieties free from some of their imperfections that the production of early-maturing varieties was included in our potato-breeding program.

The Earlainc was first grown in 1930 at Aroostook Farm, Presque Isle, Me., having originated as a cross between the Irish Cobbler and our Seedling No. 43055, the latter's ancestry including Irish Cobbler, Triumph and USDA Seedling 24642. It is a rapidly growing, early variety maturing at the same time as Irish Cobbler and Triumph when grown under the conditions prevailing in northern Maine. It is highly resistant to mild mosaic under field conditions. Since its cooking and keeping qualities are satisfactory, it seems likely to prove of value in areas outside of the Southern and Midwestern States, with especial promise for northern Maine and certain counties in New York State, where it produces good crops of smooth tubers, uniform in size and attractive in appearance. It has also met with decided favor in several Colorado districts.

POTATO INVESTIGATIONS

(continued)

The Earleine is of special value to the potato breeder because of the factors for earliness that it carries, and the abundance of fertile pollen that it produces.

The Sebago, a cross between our popular Chippewa and Katahdin varieties, is a new variety that has been selected for its blight resistance. In repeated tests for 7 years it has proved to be moderately resistant to late blight and highly resistant to mild mosaic under field conditions, and is no more susceptible to spindle tuber and leaf roll than any of the commonly grown commercial varieties. It is a vigorous-growing variety that produces comparatively high yields of high market and cooking quality.

"In 1932," says Circular 503, "a year when the estimated losses of potatoes from late blight in Maine alone were over 9 million bushels in spite of the fact that intensive spray programs were carried on throughout the State, 700 seedling varieties with a large number of Green Mountain checks were grown in an unsprayed plot at Presque Isle, Maine, to test them for blight resistance. Owing to the severity of the epidemic, nearly all the seedling varieties and all the Green Mountain checks were killed. None of the seedling varieties were free from the disease, but a small number showed infection on only a few leaves. Several of these were given further tests for blight resistance, yield, market quality and cooking quality.

"Seedling No. 44428, herein named the Sebago, proved to be the most promising of this group; and while it is not as highly resistant to late blight as is to be desired, it is so much more resistant than the commonly grown commercial sorts that it should fill a need in sections where blight epidemics frequently prevail and where spray programs have become a considerable item in the labor and cost of producing potatoes."

The Sebago appears to be adapted to environmental conditions in Maine and certain locations in New York. Because of its lateness it will probably be better adapted to late-potato sections than to early-producing ones. It ought to be especially valuable in the parts of late-potato sections that, as mentioned, are subject to epidemics of late blight that cause serious losses in spite of attempts to control the disease by spraying.

The Sebago is resistant enough to late blight to be grown in most seasons in Maine without spraying, and in seasons of severe epidemics it would require fewer applications of bordeaux mixture than the Green Mountain.

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunegan, Fayetteville, Ark.

"Voting began Wednesday, January 25 and will continue through Thursday, Feb. 2, on whether grape growers of Washington, Benton and Madison counties wish to continue in effect the marketing agreement under which their crop was marketed in 1938," he writes January 28th.

"The referendum was recommended on January 9 by Northwest Arkansas Grape Control committee. Polling places have been arranged for one day in each of seven communities, and in addition to these growers may vote at the county agent's office at any time in the voting period. Ballots will be sent to Washington, D. C. where they will be checked and results announced by the Secretary of Agriculture. The grape marketing agreement and order must be terminated if the Secretary of Agriculture finds that such action is favored by a majority of the total number of grape growers in the three counties, provided such a majority produced more than 50 percent of the total volume of grapes produced in the area in 1938."

He had reported earlier on attendance at the 59th Annual Meeting of the Arkansas State Horticulture, held at Lincoln, Ark. on January 18th.

"Mr. M. G. Lewis of Farmington, Ark. reported upon his experience in growing the Fredonia variety of grape," he wrote. "He has harvested two crops from his Fredonia vines and stated that they gave a satisfactory yield of good quality, and ripened considerably before the Concord variety so that there was no difficulty in selling them. He advocated further planting of the Fredonia to spread the grape harvest over a longer period and thus avoid overloading the markets.

"In the discussion which followed his talk, Dr. J. E. Vaile of the Department of Horticulture, University of Arkansas, pointed out that the Fredonia vines as they get older tend to ripen their fruit later each season at the University of Arkansas farm.

"I had the pleasure of discussing the control of peach leaf curl, brown rot, scab, and bacterial spot in Arkansas at this meeting.

"An examination of overwintered apple leaves made on January 20 failed to show any signs of scab perithecia in the vicinity of last year's scab lesions."

DECIDUOUS FRUIT INVESTIGATIONS

Elmer Snyder, Fresno, Calif.

"Germination of Grape Seed.---Vinifera grape seeds resulting from the 1938 breeding program were stratified from November 8th to January 4th at an approximate mean temperature of 46.4°F.," says the report for January 28th. "The flats containing the seeds were transferred on January 4th to the greenhouse with temperatures ranging from 60° to 80° F. plus. In 23 days at a mean temperature of 67.9°F. 20.8 percent of the seeds had germinated. More seeds will undoubtedly germinate during the next two weeks. While some seeds germinated in 18 days a rapid showing of cotyledons was noted from the 20th to the 23rd day. Considerable variation in germination of the different seed samples was noted. There was no definite correlation in germination between seeds of early or late ripening varieties used in the crosses. In closely related crosses or where one parent was the same in a number of crosses, the smaller seeds apparently showed quicker germination.

"Rainfall and Temperature.---The seasonal rainfall recorded at Fresno to date amounts to 3.62 inches compared to 5.57 inches for the same period last year. The snow pack in the high Sierras so far reported is considerably less than last year. The underground water level, however, at the Fresno vineyard stands 2 feet 11 inches closer to the soil surface than at the same date last year.

"Winter temperatures during December and January have been above normal and probably indicate early growth starting or spring 'just around the corner' in California."

ADMINISTRATIVE NOTES

Income Tax On page 39 of the News Letter for February 1, 1938, with reference to income tax, employees were informed that they must keep their own record of receipts in payment of expense accounts, therefore the carbon copy of Form 1099, recently mailed you if you are within the taxable group, represents only gross salary earned during the period January 1 to December 31, 1938, whether paid during that period or subsequently.

To this amount should be added the sums you have received during this January 1 to December 31, 1938 period in payment of expense vouchers. A check dated in January 1938 for travel actually performed in December 1937 must be shown as income for the period ending December 31; but a check dated January 1939 for travel in December 1938 will be carried over into the next tax report--that is for the January 1 to December 31, 1939 period. It should not be included in the 1938 report.

Actual expenses incurred while traveling may be shown on your tax returns as allowable deductions, of course.

DECIDUOUS FRUIT INVESTIGATIONS

E. S. Degman, Medford, Oreg.

"The pear varieties are all out of the rest period, the different varieties coming out in about the same order as reported by Chandler," he writes from the U. S. Pear Field Station on January 23d.

"The Bartlett was last to come out and it sets better than the rest. Anjou was first to come out and it sets poorest. Incidentally, the peach varieties which we brought in are not yet entirely out, at least some of the twigs brought in January 4 have not moved in the 19 days, others are in bloom. We had about 1400 hours below 45 between October 1 and January 4."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

J. M. Lutz (Handling, transportation, storage and utilization)

"The experimental frozen pack of fruits made at this Station was inspected during the week," he reports December 31. "Freezing seems to be a very good method of preserving the Boysenberry. The high acid content of this fruit seems to blend in well with the sugar sirup used in freezing. Because of the highly perishable nature of the Boysenberry, freezing preservation appears to be a very valuable method for the successful transportation and storage of this fruit. Fairly good results were obtained in packing peaches without added sugar or sirup by using very rapid freezing, although the material obtained in this manner oxidizes very rapidly upon exposure to air and must be consumed very shortly after removal from the freezing room. In four hours at room temperature the material was so badly oxidized as to be valueless."

N. H. Loomis (small fruit investigations)

"An inspection of the vineyards has shown that the grape varieties Carman, Catawba, Goethe, and Manito were severely injured by the first freeze of the season which occurred on November 25 with a low of 22°F. It is interesting to note that the muscadine grapes were entirely uninjured, yet they are too tender to withstand the low temperatures farther north."

NUT INVESTIGATIONS

Milo N. Wood, Sacramento, Calif.

"We have had a very warm, open winter and the rainfall is considerably below normal in the Sacramento Valley," he writes January 21. "The signs to date point to an early almond blooming season. I have been recently informed that the No Plus Ultra variety is already in bloom in the Banning district and I understand that some of the early varieties are blooming in the Capay Valley."

B. G. Sitton, Shreveport, La.

"In the study of nut quality of the different varieties of pecans the Caspiana was best, with 98.4 percent No. 1 nuts, and Sabine and Nelson were poorest, with less than 35 percent No. 1 nuts. All other varieties had more than 65 percent No. 1 nuts. Mahan, which produced an average of 60 pounds of nuts per tree this year had 89 percent No. 1 nuts. Mahan nuts ran a higher percentage of No. 1 nuts than did Moore, Success, Schley or Stuart, and were exceeded only by five other varieties; none of which have been high producers."

F. S. Lagasse, and Richard C. Nelson, Gainesville, Fla. (Tung Investigations)

"Circumference measurements were completed on the selected trees for particular use at this time of determining the yield-cross sectional area of the trunk ratio," says the report for the week of January 23-28. "Also, due to the fact that the garbage can dessicator that was being tried out was so slow, Dr. Nelson suggested a larger type with forced air movement."

"A discarded Westinghouse refrigerator shipping crate was obtained for 50 cents, set on its side, with one of the sides swinging on hinges. It was paraffined inside, and two light bulbs and an 8-inch \$1.59 fan installed within. Shallow paraffined cookie trays were laid on the inner lower surface and saturated Ca Cl₂ solution poured in.

"It was found that this type of dessicator was about three times as rapid in removing the moisture from the tung fruits, and at present is carrying 18 samples of 25 fruits each. The fruits are placed in 'hardware cloth,' wire frames, layer upon layer. This quite inexpensive outfit looks very promising as a means of bringing the tung fruit samples to constant weight."

NUT INVESTIGATIONS

F. N. Dodge, Shreveport, La.

"The vetch cover crop on the station has been making poor growth," he writes concerning the situation at the U. S. Pecan Field Station at Robson, La. "Melilotus indica is doing far better than vetch. Rye is again repeating its performance of last year in not growing around the trees. At present (February 4) there is a circular area about 40 to 45 feet in diameter around each tree in the rye plots which has a poor stand of weekly growing plants. Outside of this area the stand is much better; the plants are stronger, and greener; and are more than twice as large. This area has increased about 2 feet in radius from last year, and gives an indication of the increase and extent of the root growth. It also indicates the possibility of root crowding within two years, since the trees are only 50 feet apart."

John R. Cole, Albany, Ga.

Writing from the U. S. Pecan Disease Field Laboratory on February 4th, he quotes a typical letter received from a pecan grower--this one came from Denmark, S. Car.:

"I am very grateful for the valuable information supplied me during the past year on pecan scab disease. There has been no spraying of pecan trees in this section for scab, and due to our approximately 85 percent loss last season there are many growers who are deeply interested this season. I am planning to buy a spray outfit this spring so as to take care of a grove of approximately 1,000 Schley trees, ranging in age from ten to twenty years."

C. E. Schuster, Corvallis, Oreg.

"We made a trip to the Dalles to attend a meeting of fruit growers," he writes in his report for February 3d. "There was a good attendance and considerable interest was shown in our work, particularly in our fertilizer work."

"An interesting statement was obtained from one of the growers. This individual has considerable tile in the draws and low spots in his orchard. Usually, he claims, at this time of year the tiles are running good streams of water. This year the tiles are dry. Here at Corvallis the rainfall is about 9 inches short for the season since the first of September. During January we were short over a third of the normal rainfall. Every month so far this year has been below normal in rainfall."

TOMATO DISEASE CONTROL BY BREEDING

Discussing the control of tomato diseases of the Intermountain States and the Pacific Coast, Dr. H. L. Blood told the Raw Products Conference, Convention of National Cannery Association, Chicago, Ill. late in January, that the principal tomato disease problems of those regions which require plant breeder technique for solution are curly top (virus), Verticillium wilt, spotted wilt (virus), and the mosaics (virus). Bacterial canker, he said, may be brought under more effective control by disease resistance than by methods of seed treatment and cultural sanitation.

"Curly top is an important problem in tomato production in all of the States west of the Continental Divide," he pointed out. "It is most serious in the commercial tomato producing areas of Utah and California. From \$100,000.00 to well over \$1,000,000.00 are lost annually to the tomato industry of Utah as a consequence of this disease. Because of the nature of the disease and the insect vector responsible for its dissemination, the development of resistant tomato varieties offers the most effective and practical means of control.

"Seven years of intensive study have resulted in the selection of several strains of South American and Mexican wild and novelty types that are showing considerable resistance. In 1938, 14 selections from original wild and novelty stock and 5 from hybrid stock developed from 50 to 80 percent curly top on the Hurricane trial grounds in Utah, as opposed to from 98 to 100 percent curly top in the unselected stock and hybrid parentage checks. One of these selections developed 11.5 percent curly top in 1937 and 3.25 percent in 1938, in contrast to the Stone variety which developed 75 percent curly top in 1937 and 22.7 percent in 1938, when planted under the same conditions. An intensive breeding program is planned to incorporate that degree of resistance into commercial types of tomato. The search for a greater degree of resistance will be continued relentlessly," he promised.

"The Verticillium wilt disease has become a serious problem in some sections of the West," he explained. "It is most destructive in the older tomato-producing areas of California and Utah. In 1938 the disease caused a loss of approximately \$335,200.00 to the tomato industry of Utah. Crop rotation and cultural practices are not adequate to take care of the problem, consequently the development of resistant varieties appears to offer the best means of control. A thorough study of cultivated tomato varieties has failed to reveal a very high degree of resistance to the wilt pathogen. Selections of a Peruvian wild tomato with a very high degree of resistance to the disease have been made. A breeding program is being initiated in an effort to combine the resistance of the Peruvian wild with the desirable qualities of the best commercial varieties of tomatoes. A search for greater resistance among recent introductions from South America will also be made.

TOMATO DISEASE CONTROL BY BREEDING (continued)

"Spotted wilt is particularly a problem of the Pacific Coast," said Dr. Blood. "Dr. D. W. Porter, formerly of the University of California, who initiated the breeding work on this problem, reports crosses with resistant Ly. pimpinellifolium x Marglobe in the F6 generation practically equal to Marglobe in fruit type and size, in vine type, and in the possession of the resistance of the Red Currant variety. It has proved to be quite difficult to develop adequate fruit size and vine type in the hybrid progeny of Ly. pimpinellifolium. Other forms of red fruited wilt-resistant types may be found that can be used with greater advantage. A great many forms have been introduced recently from South America, for study.

"No appreciable degree of resistance to tomato mosaic is known. This disease is so widely disseminated and so difficult to control consistently by the application of cultural methods that it has become accepted as something that has to be lived with. Recent introductions from South America are to be tested for resistance to this disease. It is hoped that some degree of resistance may be found in some of the collections from Bolivia, Argentina and Chile, where virus diseases are very plentiful and extremely destructive.

"Experimentally, bacterial canker has been effectively controlled under Utah conditions," he disclosed. "While a procedure for the control of the disease has been outlined, it has been difficult to obtain an adequate use of the methods recommended. The development of disease-resistant varieties would eliminate such difficulties.

"Introductions from South America recently made by the Division of Plant Exploration and Introduction of the United States Department of Agriculture, include two distinctly different groups of species of the tomato genus Lycopersicum. One of these, the red-fruited group, is represented by the species esculentum and humboldtii. The other, or a green-fruited group, is represented by the species hirsutum, chilense, peruvianum, perhaps agrimoniaefolium, and other unidentified species. Of this latter group peruvianum is known to be highly resistant to Fusarium wilt. Hirsutum appears to possess a greater degree of resistance to curly top than other species, but is utterly worthless as an economic plant. One of the questionable species has shown some resistance to the leaf spot diseases. Some of the red-fruited species of wild forms have exhibited resistance to bacterial canker but little is known of the response of any of these forms to the mosaic diseases.

"The value of the green-fruited types in any breeding program remains to be demonstrated. The possession of resistance to several of the important tomato diseases renders this particular group potentially very important, and it is hoped that hybridization may give rise to commercially desirable varieties."

ADMINISTRATIVE NOTES

Airplanes For those of you who use your own airplanes in official travel, it should be pointed out that the only statutory authority for the commutation of traveling expenses of civilian employees in a travel status to reimbursement on a mileage basis is the Act of February 14, 1931, as amended, which covers only official travel by the employee's own motorcycle or own automobile. Thus an employee authorized to travel by his privately owned airplane may be reimbursed only on an actual expense basis not to exceed the cost by available common carrier.

Fiscal Year Obligations The General Accounting Office says that the rule that a claim is chargeable to the appropriation for the fiscal year in which the liability was incurred, is applicable in all cases in which there is a definite determination as to the time the public funds become obligated for the payment of a given liability, whether the amount is, or is not, certain at the time. As an illustration: An agreement providing for testing certain cattle and payment of indemnity for those reacting to the test for Bang's disease, etc. is an obligation against the appropriation for the fiscal year when the agreement is executed, notwithstanding the cattle may have been slaughtered the following fiscal year.

Leave Where employees previously occupying emergency positions are given appointments without break in service, classed as temporary by the Civil Service Commission, to be followed by permanent appointment upon determination as to their qualifications for transfer to the classified civil service, the Accounting Office has ruled that the positions to which the employee is temporarily appointed are to be classed as "permanent" for leave purposes.

The amount of leave to be charged employees separated from the service under conditions that require charging them with excess or overdrawn leave, should be computed in accordance with the leave regulations in force when the excess or overdrawn leave was taken; but in determining whether employees are separated under conditions which do or do not require charging them for such leave, the regulations in force at the date of separation from the service govern.

Temporary service for a period of six months under a three months initial appointment which is extended without break in service for another three months is regarded as one temporary appointment for leave purposes.

There is no authority under the annual leave act or the uniform annual leave regulations covering the transfer of leave credit from a temporary to an emergency position, whether in the same or different governmental agency.

ADMINISTRATIVE NOTES
(Robert W. Linehan)

The Beltsville seminars continue to hold keen attention. For February 17th, Dr. Stevenson has planned to have Dr. S. A. Waksman of the New Jersey Agricultural Experiment Station discuss the fungus population of the soil. Dr. Waksman is an outstanding authority in this field. Dr. M. B. Waite is scheduled for the February 20th meeting. On February 6th, Dr. D. L. Van Dine, principal entomologist in charge of the Division of Fruit Insect Investigations of the Bureau of Entomology and Plant Quarantine described the Japanese beetle, its food habits, distribution and present status in this country.

The Division was well represented at the meeting of the Southern Agricultural Workers' Association, New Orleans, La., February 1 to 3. Among those in attendance or contributing to the program were Drs. Boswell and Crane from Beltsville; B. L. Wade and C. F. Andrus from the U. S. Regional Vegetable Breeding Laboratory at Charleston, S. Car.; L. P. McCann, Geo. F. Potter and Ernest Angelo from Bogalusa, La.; F. S. Lagassee, Gainesville, Fla.; J. H. Painter, Cairo, Ga.; J. H. Weinberger, Fort Valley, Ga.; Geo. P. Hoffman and J. M. Lutz, from the U. S. Horticultural Station at Meridian, Miss.; B. G. Sitton from Shreveport, La.; C. L. Smith and Louis Romberg from Brownwood, Tex.; and E. L. LeClerc from University, La.

After the meeting, Dr. Crane held a conference at Bogalus, La. with the tung investigations staff for a general discussion of future work.

Mr. D. F. Fisher is expected back in Washington shortly from a trip through the South and West, where he has been conferring with members of his field staff.

Dr. A. C. Hildreth, superintendent of our Cheyenne Horticultural Field Station, is spending a vacation at Berkeley and other points in California, continuing a study of some of the research problems in which he is especially interested, including newer phases of physiology, particularly the plant hormones.

Mrs. Esther B. Zisman, popular member of the administrative staff and for some time serving as Mr. Gould's secretary, has accepted a position as secretary to the Assistant Chief of the Childrens' Bureau of the Department of Labor. Mrs. L. K. Fowle has been brought back from the Division of Tobacco and Plant Nutrition to take up her former position as Mr. Gould's secretary. Incidentally, Mrs. Fowle is a charter member of the Beltsville Pioneer Women, a group of the girls included in the first assignment of workers to the U. S. Horticultural Station, Beltsville, Md. The group holds an annual banquet, the most recent, February 7, at the Hotel Chastleton, Washington, D. C. being attended by 24 guests.

Vol. 11 No. 4

February 15, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture
John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI

Washington, D. C., March 1, 1939

No. 5

Experimental
Methods and
Techniques

Discussing recent advances in experimental methods and techniques, Dr. Victor R. Boswell in a talk before the Methods Symposium meeting of the Southern Agricultural Workers Association at New Orleans, La. early in February remarked that research workers are generally supposed to be the most progressive people in the world (Applause!) and most research specialists actually are on the alert for new and improved farm, laboratory and office equipment as well as new reagents for special uses and new manipulations or modes of operating their tools.

Unfortunately, he added, new ideas are adopted less readily than tangible things. Too often, highly improved and efficient machines are used only to increase the amount of badly planned and badly executed work. Fine, high speed equipment in the hands of some serve only to record errors in greater detail and to make mistakes faster. Skilled technicians are far less likely to err in mechanical operations than in overlooking some set of observations or detail of experimental design that is absolutely requisite to solving a problem. They are too often carried away by the desire to accomplish work on a grand scale, to cover all possible ground in the shortest possible time, and with no delay in starting--hence devote inadequate attention to design and method of treating results. Leaders in the field of experimental design and analysis have emphasized that the method of studying and analyzing results must be determined before the experiment is started, and the experiment designed around that method.

Dr. Boswell pointed out by a number of examples that there are two great enemies in particular that have nullified many of the strenuous efforts of a legion of ambitious workers. They are (1) The inadequate check or control, and (2) unmeasured variation.

EXPERIMENTAL METHODS AND TECHNIQUE (continued)

The first of these is perhaps responsible for the more obvious and spectacular failures to solve problems, said Dr. Boswell, but the second is just as deadly. We must avoid inefficiency and waste in our work by insuring that our designs are logical, and by striving to control or measure every possible factor that may affect the outcome of our experiments.

Dr. Boswell recognized that we cannot become proficient in handling complex designs and analyses "in ten easy lessons," and vigorously disclaimed his own proficiency in more than elementary problems. He pointed out, however, that there are a number of comparatively simple designs that can be and should be thoroughly understood by every investigator, if his work is to be really effective.

There are also a number of extremely useful, and even essential, methods of determining the significance of differences observed in experiments, and which can be handled by anyone who takes a little trouble to learn how. We do not have to become specialists in statistical methods in order to adequately handle most of the comparatively simple experiments or investigations that it is necessary for us to do in our particular line of work. (We don't have to be mechanical engineers in order to operate an automobile properly!)

All of the speakers in the symposium, as well as many of the audience, emphasized vigorously that proper attention to these matters is imperative to successful conduct of experimental and investigational work.

It was suggested that all workers not now familiar with these simpler methods and designs should get in touch with some of their associates who can help them in a voluntary course of study and practice. A rather large study-group has been working for some months at the U. S. Horticultural Station, Beltsville, Md., having regular meetings outside of official hours. The formation of additional study groups should interest large numbers of our personnel and pay big dividends through increased efficiency.

These methods are not an unmitigated burden but actually reduce the work and cost required to arrive at safe and sound results. Dr. Boswell insisted, Furthermore that they represent a fascinating and intriguing subject that never fails to provoke vigorous discussion and a desire for further knowledge among those who under take to work with them.

Dr. Boswell emphasized his remarks by presenting a considerable number of examples from recently published papers to illustrate unjustified conclusions drawn from "experiments" with inadequate checks or with no checks at all; with measured variation that was ignored, and with variation that was unmeasured.

PROGRESS REPORTS

February 10, Mr. Gould sent out a call for the annual reports of progress. It may not have occurred to you, but this call is one of the most important issued during the year, so far as the individual worker is concerned. Your official life may depend upon the impression the report makes on budget officers and members of Congressional Committees. The method of preparing the report, the forms to be filled out, may vary from time to time, but it is a wise plan for you to put yourself in the position of the Chief of Bureau before the Budget Committee or before a committee of Congress, fighting for your work. Supply all the facts that you can both with regard to what you have been accomplishing and what your work means to the industry which you serve. Boil down this information into a concrete and specific statement of accomplishments. In addition, indicate briefly on a separate sheet what, in your judgment, is the most outstanding accomplishment of the year in your work--or the phase of it in which the most fruitful eventual results seem likely to be obtained.

The report is for the fiscal year July 1, 1938 to June 30, 1939, which, of course, restricts the discussion of actual accomplishments to the portion of the year preceding the date of preparation--and the reports should be in Mr. Gould's hands by March 15 at the latest. To a considerable extent accomplishments are coordinated with the crop rather than with the fiscal year, so that in many cases any portion of a report that concerns work during the last few months of the fiscal year will obviously deal with plans for the initiation of seasonal activities, the results of which will be reported for the fiscal year beginning July 1, 1939.

A separate report is needed for each research problem (research line project), giving its proper number and title. A report on each line project that has been approved is required even if only a small amount of work has been done, or if it has been inactive during the year. No report is required for projects that have been definitely discontinued. Similar reports, of course, are needed on all Bankhead-Jones projects.

PUBLICATIONS.--For several years section leaders furnished with their progress reports lists of publications of their staff issued outside the Department. These reports were not requested in 1937 and 1938, but will be needed this year. Please, therefore, include a list of all publications issued outside the Department (published in outside journals, that is) together with a list of any mimeographed circulars--we call them "briefs"--prepared and distributed during the period from July 1, 1938 up to the time of the preparation of your report.

It is not necessary to include papers submitted for publication in the various series issued by the Department.

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Geo. P. Hoffman, vegetable crop investigations.

"Examination of sweetpotatoes in the delayed harvest plots on February 6 revealed that there are yet some fair to good potatoes 68 days following the first hard freeze," he reports February 11th.

"Delayed harvest has without question proven this season that it has a place in prolonging the operating season of the sweetpotato starch plant. There seems to be a direct relation between soil moisture and keeping quality of unharvested sweetpotatoes--high soil moisture being conducive to earlier breakdown. Consequently, low and poorly drained land as well as land which might be subject to overflow, might be more questionable for late or delayed harvest than is upland."

He had written earlier, January 28th: "A trip was made to Crystal Springs for the purpose of seeding tomatoes for use in the variety and selection trials on the W. L. Green farm. Tomato seed beds are conspicuous throughout this section; growers generally have finished seeding their tomatoes and it would seem that there is no anticipated increase or reduction in tomato acreage for the approaching season.

"Reports and observations suggest that the Marglobe variety might be a bit more generally used than during the past year and that growers are largely using treated seed to ward off damping-off disease. Cabbage and pea plantings are well under way with an apparent increase in acreage. Diseases in cabbage plant beds seem to be giving more trouble in the Crystal Springs section this year than usual. Growers are complaining in that section because of the short season over which both cabbage and tomatoes produce."

N. H. Loomis, small fruit investigations.

"Pruning in the muscadine vineyard was completed this week" he reports for the week ending February 11th.

"It was very outstanding that the varieties susceptible to black rot (on the foliage) were much less vigorous than the resistant varieties. Some pruning was done on the bunch grapes. Pruning weights for the Champanel variety averaged 14.7 pounds per vine. This variety is exceptionally vigorous and especially last year since the frost killed the entire crop. Unfortunately, yields have never been in proportion to the vigor of the vine. Many other varieties in adjacent rows to the Champanel do not average 1 pound of prunings per vine, showing the difference in adaptation."

HANDLING, TRANSPORTATION AND STORAGE, AND MARKET DISEASE INVESTIGATIONS.

Edwin Smith, Wenatchee, Wash.

"Mr. Ryall and the writer examined Jonathans in Yakima January 30-31 and February 9-10 to observe the effect of various washing treatments," he reports February 15th. "This involved the weighing of tagged specimens to determine loss in weight following washing and storage. The greater amount of shrivelling apparent in the lot washed with mineral oil and hydrochloric acid was not strikingly reflected in weight loss. It would appear that an apple loses a small amount of water in the vicinity of the skin to cause serious shrivelling or wilting...."

"Dr. Joseph B. Moore has arrived in Wenatchee from the New York Experiment Station at Geneva to take the position as entomologist with the Tree Fruit Branch Experiment Station, which position was vacated in December when Dr. James Marshall left to take a position with the Dominion Department of Agriculture at Vernon, B. C.

"The apple season is not proving so prosperous as was anticipated when the short national crop was forecast. Some growers are doing all right but moderate prices have prevented the realization of a bonanza sufficient to pull growers out of debt. Delicious, of which there will be about 6,000 cars in the Wenatchee district, are selling at \$1.50 for selected sizes and \$1.35 for large sizes. Winesaps are selling for a slightly lower figure. The apple shipments from this district probably will exceed 16,000 cars...."

He had written February 1: "The District Horticultural Office has reported that up to the present time decay in Delicious apples in storage has not been abnormal in its extent. However, some inspectors and fieldmen have stated that they have witnessed more grief in Delicious this year than in any previous season. This seems to be confined to certain districts. It may be that the use of washing solutions (at lower temperatures in some of these districts has resulted in a higher spore population in the washing solutions. Today (February 1) I examined a lot of Delicious grown at Leavenworth which apparently had been handled under ideal conditions at the time of harvest. They were brought in immediately from the orchard to the Peshastin Fruit Growers Association, precooled while loose, then washed and packed and held at 32°. Many boxes were showing 10 or 12 percent lenticel decay and some of the apples had from 3 to 10 rotten spots, starting where no injury was observed. Close examination of the lenticels on these apples showed that many had very irregular edges and would be termed 'open lenticels.' The owner of these apples showed us a sample which had been picked up in the orchard and held in his basement garage since the time of harvest and these were free from lenticel decay. The lenticels on these apples seemed to be much better corked over than those which had gone into storage."

HANDLING, TRANSPORTATION AND STORAGE, AND MARKET DISEASE INVESTIGATIONS

Edwin Smith (continued)

On January 18th he wrote: "Dr. Gerhardt and the writer were in Yakima on January 6 to examine Bosc and Anjou pears which Mr. Ryall had ripened. The outstanding points from this examination were related to the difference in quality of the lots picked at different periods from full bloom. Again it is apparent that Bosc and Anjou pears from the Medford district require a longer period (possibly 10 days) between the date of full bloom and the time when the fruit reaches a satisfactory degree of maturity for harvesting than would similar varieties grown in Hood River, Yakima and Wenatchee.

"The Bosc pears grown in the Rogue River Valley were again superior in dessert quality to those grown in the more northern districts, whereas Anjou pears from the northern districts were generally superior to those grown in Medford.

"The second point related to the lack of ripening response in the different lots of Bosc pears as related to time of picking. Frequently the lots picked late ~~lost~~ their ripening response to a greater degree than those picked earlier. However, this was not observed in every lot. Bosc pears from Medford were retaining their capacity to ripen with good quality later than were the Bosc from the more northern districts."

TEN MOST IMPORTANT TREES

The American Nurseryman for October 1, 1938, just called to the News Letter's attention by Dr. H. R. Fulton, contains the germ of a dandy argument concerning the relative importance of trees.

"If you were asked to name the 10 most important trees in the world," it says, "would you put the date palm first? Henry E. Clepper, secretary of the Society of American Foresters, does, having been asked by the American Nature Association. 'To win a place, a species had to be of great importance to man,' he said. 'It has to be in extensive use for a long period of time (one exception was allowed, rubber); it had to be a species that, if suddenly taken from the earth, could not readily be replaced by any other.' He put the coconut palm second, the almond third, the apple fourth, the fig fifth, the mulberry sixth, the olive seventh, the lemon eighth, the cinchona ninth and rubber tenth. Lumber trees were left out because the products of any one can be duplicated by other species."

Not everyone will agree with this list, of course. It is interesting to know, however, that we have active projects on 6 of the 10, and members of our staff have had occasion to investigate diseases of two others.

FLORIDA STRAWBERRIES--AND PRECOOLING

Dr. D. H. Rose of our section of handling, transportation and storage and market disease investigations has found a new use for the strawberry--Dr. Darrow please note! Yes, he is using Florida strawberries to point a moral and adorn a tale.

Speaking of the manifest improvement in handling and shipping Florida's important strawberry crop, and in particular the fact that every one connected with the industry realizes that precooling is a "good thing" for the strawberries, he points out that there really is a difference between good and poor precooling!

"Some believe that a carload of strawberries has been precooled if fans were operated within the car for a while, the length of the 'while' being unspecified. Others, including some of those engaged in precooling as a business, maintain that a load is properly or well precooled if the fruit temperature at the top doorway is 36° or 40° F., or some other chilly-sounding figure. The truth of the matter is-- and this point cannot be emphasized too often--that it is not possible to bring strawberries to a good carrying temperature in 1 or 2 hours by any method of precooling now in use; 4 to 5 hours or longer may be required. And even if the fruit at the top doorway actually does have a temperature of 36°, it is possible and undoubtedly often happens, that the rest of the top layer clear back to the bunker is 5° to 10° warmer. A method that gives a much more reliable indication of how good a job of precooling has been done is to take temperatures at several places in the top layer from the doorway to the bunker.

"A still better method of judging the efficiency of precooling is to measure or estimate the quantity of ice melted during the time the fans are operated. It has been found that in cars of strawberries pre-cooled with pressure-type fans, for example, where good carrying temperatures throughout the load were obtained by the precooling, the drop in temperature per ton of ice melted in the car during precooling and loading averaged 11.6°F. and ranged from 7.4° to 19.7°. None of the cars involved in this test was precooled for less than 4 hours and all but two were pre-cooled for more than 5 hours. The drop in fruit temperature in a car where old style bunker blowers were used was only 3.0° per ton of ice melted during precooling and loading.

"The fact to be kept in mind here is that in a refrigerator car where cooling can be obtained only from the ice in the bunkers, it is impossible to cool the fruit without melting the ice. The quantity melted is a measure of the heat removed from the inside of the car. If this is small, the load cannot have been cooled very much, no matter how long the fans have been running or how low the temperature of the fruit at the doorway may be. If the quantity of ice melted is large, good cooling of the load can be considered certain provided that the car is in good condition, the doors have been kept closed, and the weather is only moderately warm.

FLORICULTURAL INVESTIGATIONS

Tulip Breaking We are glad to see that one of the News Letter's favorite contributors, Dr. Frank P. McWhorter, has received editorial attention in the Gardeners Chronicle of London. The issue for January 21 says, in part: "For several hundreds of years gardeners, seeking to produce new multi-colored varieties, were working in the dark, for they did not know the underlying processes which gave rise to the whole host of types now labeled Feathered, Flamed, Bizarres, Bybloemens, Rembrandts, etc. In the past few years the position has radically altered and we now know that it is a virus infection which causes tulips to 'break'--a virus with the most ancient pedigree.

"A paper (The Antithetic Virus Theory of Tulip Breaking, by F. P. McWhorter, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture, in Annals of Applied Biology, May, 1938) has revealed that not one but two viruses are at work. Virus number one removes the existing color from the flower while number two adds or intensifies floral color...

"The proportions in the virus mixture are all important; a little of virus number one goes a long way, but a lot goes too far, for it then cripples the plant. For the best results the amount of virus number two should be ten times that of virus number one. This prescription will not benefit other patients and, as yet, it seems that each tulip is a law unto itself when it comes to the correct virus physic..."

What is a "broken tulip?" With the exception of "Parrots," Dr. McWhorter explains, tulip varieties originate from seed. Usually the seedlings, after 4 to 6 years, bear flowers of simple colors evenly distributed over the surface of all the petals or else shades of the same color uniformly distributed over each petal. Rarely they are of two distinct colors, as for example, the varieties Keizerskroon and Columbus. When the normal color (or colors) of the seedling or an established variety becomes rearranged into "flash" and dissimilar patterns, the condition is called "broken".

The flesh or ground tissue of tulip petals is always either white or yellow. The bright colors (reds, pinks, purples, etc.) are all confined to the outer cell layer (epidermis) of the flower. When a tulip breaks, the purple or red pigment is removed from some areas of the epidermis and added or intensified in others. The contrasting color patterns result from exposure of the ground color. In some red tulips, however, (for example, King Harold) breaking is expressed only by darkening of the red pigment in irregular areas. All such color rearrangements are called "breaking" and are evidence of a disease. Broken tulips can be easily produced experimentally, but they are undesirable because the color removing virus is destructive to tulips, may be dangerous to lilies, and is responsible for the weak appearance and "running out" of individuals among groups of broken tulips.

NUT INVESTIGATIONS

Pecans: Discussing three years results of thinning the stand as compared with pruning thickly planted pecan trees, Dr. C. L. Thinning Smith pointed out to the Richmond meeting of the vs. Pruning American Society for Horticultural Science that in the average orchard pecan trees are planted about 50 x 50 feet on squares, or closer. They begin to crowd after 15 or 20 years. The normal root spread of a pecan tree being about twice that of the branch, the roots begin to crowd even before the branches are touching.

The number of trees per acre may be reduced by thinning the stand or the size of the trees may be reduced by pruning. In the experiment discussed, 12-year-old Burkett and Texas Prolific pecan trees were pruned in 1935, 1936 and 1937 so as to reduce the tops about one-fifth. The pruned Burkett trees stood approximately 27x27 feet on a square; the Texas Prolific about 18x18. In other comparable blocks the Burkett trees were thinned to approximately 45x45 feet on squares and the Pacific Prolific to approximately 30x40 feet on rectangles.

The average yield of nuts per acre for the three-year period from pruned trees was about twice as great as from unpruned, unthinned trees. The foliage of pruned trees remained in normal condition on the trees until late in the season each year, whereas a considerable portion of the leaves of the unpruned, thinned trees dropped prematurely except in 1937, when all trees were sprayed with bordeaux mixture. In this year there was no apparent difference in foliage conditions on the pruned and unpruned Burkett trees, but that of the pruned Texas Prolific remained on the trees later in the season and was in better condition than that of the unpruned, thinned trees.

During the fall of 1935 about 25 percent of the nuts on unpruned Burkett trees germinated just prior to harvest time. About 50 percent of the leaves on these trees dropped prematurely during the nut-filling period, whereas no leaves dropped from the pruned trees and none of the nuts sprouted. Also, nuts from the pruned trees of this variety were better filled than those from the unpruned, thinned trees. With an excess of soil moisture during the filling period in 1935, and with the reduced leaf area, the nuts on unpruned trees probably were subjected to a very high concentration of water which was conducive to sprouting in this variety, whereas the large number of leaves on the pruned trees were able to rid the nuts of excessive moisture by transpiration. Due to the stimulation of new shoot growth by the pruning, the pruned trees had more foliage per nut in years of fair to good crops than unpruned trees, and apparently were able to fill the nuts and also store sufficient carbohydrates in the trees to cause a set of nuts the following year. Such a condition tends to eliminate alternate bearing, which is so common in the pecan. This was evident in 1936, when the pruned trees set and matured a profitable crop of nuts following the heavy production of 1935, whereas the crop from unpruned, thinned trees was not large enough to be profitable.

NUT INVESTIGATIONS

Milo N. Wood, Sacramento, Calif.

"A very interesting discussion was held with the farm adviser's office concerning the fertilizer demonstration plots established in walnut orchards and which have been under observation for several years," he writes February 4th. "In many cases outstanding positive results were observed. It appears that the November freeze did considerable damage to some of the walnut trees in that district, probably more than growers realize. The farm adviser's office is wisely advising growers to postpone pruning until the growth in the spring shows definitely what branches have been damaged by the freeze. It is expected that many of the southern California walnut orchards will suffer from delayed foliation this spring, owing to weather conditions to date which have been compared with those of past seasons during which delayed foliation was pronounced."

Max B. Hardy, Albany, Ga.

"During the week an appreciable amount of rainfall was recorded but the soil is not yet saturated to the extent we would like to see," he writes from the U. S. Pecan Field Station and Laboratory on February 11th. "Temperatures were similar to those we might expect in late spring and as a result peach, plum, and pear trees are showing considerable activity, with many pear trees being in full bloom. Some swelling of pecan buds has been noted and the winter cover crops are developing fairly rapidly."

John R. Cole, Albany, Ga.

"Growers interested in spraying to control the scab disease continue to visit our laboratory in large numbers," he writes from the Pecan Disease Field Laboratory on February 11th. "They are interested in the latest types of spray machines, as well as our spray calendar. It seems that every grower that possesses pecans of the Schley variety, located North and East of Albany, will be spraying to control the scab disease this season."

Paul W. Miller, Corvallis, Oreg.

"It would appear from a letter received from the North Pacific Nut Growers Cooperative at Dundee, Oreg. that the members of the association will use close to a ton of our new blight spray, copper oxalate, during the coming season for the control of walnut blight. The association is pooling the requirements for their members and they have already received orders for about 1500 pounds of this chemical. We are advising the growers to go slowly at first and test it out on a small scale for a season or so before using it on the whole orchard. For general use we are still advising bordeaux mixture, 3-1-50 formula, plus a mineral or petroleum spray oil, 1 pint to 100."

DECIDUOUS FRUIT INVESTIGATIONS

John H. Weinberger, Fort Valley, Ga.

"Flower buds on Elberta and Hiley peaches at Fort Valley have advanced rapidly during the warm week just past and the dormancy-breaking experiments on these varieties have necessarily been concluded," he writes February 13th, from the U. S. Horticultural Field Laboratory.

"Early Rose and Mayflower are fully dormant and will be given another spray application or two. Early Hiley flower buds in the stock orchard range from the gray to the green stage, and an occasional one may be seen with pink petals showing. Last year at this time these trees were 10 percent full bloom.

"With regard to the dormancy-breaking sprays, it is possible to see definite evidences of growth stimulation from almost all applications, regardless of time, but the results indicate that there is a brief period in which to apply the sprays for best effects, and that period varies for each variety. It is probably associated with the cold requirements of the variety and the extent to which these requirements have been met prior to spraying. Evidence to be obtained at blooming time in our experiments should furnish the necessary information on this point."

John C. Dunegan, Fayetteville, Ala.

"Official announcement has been made that Dean D. T. Gray, of the College of Agriculture, University of Arkansas, tendered his resignation effective as of December 31, 1938," he writes from the Fayetteville laboratory on February 11th. "He has consented to remain on duty until June 30, 1939 unless relieved by the appointment of his successor prior to that date.

"Dr. J. E. Vale of the Horticultural Department of the Arkansas station reports that low temperatures of the past two days have killed one-third of the fruit buds on peach trees at University farm."

ADMINISTRATIVE NOTE

Appointments The Civil Service laws and regulations relating to appointments, and the Classification Act of 1923, relating to the fixing of salary rates, are separate and distinct statutes with entirely different scopes and purposes, the General Accounting Office points out in ruling A-95425-S. The Classification Act requires that new appointments must be made at the minimum salary rate of the grade in which the position has been placed.

Vol. 11 No. 5

March 1, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

Of course, since our results are made available through world-wide correspondence, bulletins and other publications distributed by the tens of thousands; articles in agricultural and other journals; by radio; through press releases to the newspapers; and by lectures and addresses before scientific meetings and growers' conventions, our light is not exactly hidden under a bushel. Probably not even the editor of Country Home realizes that in our Division alone there have been many single pieces of work that under such a royalty plan would, by themselves, provide the necessary funds for all of the activities of the Division.

For example, while not a result recently achieved, the present standard type of refrigerator car is built in close conformity to specifications worked out by our specialists. What a royalty that improvement would pay! The method of controlling apple storage scald by the use of oiled wraps or shredded oiled paper is estimated to save growers as much as two million dollars a year. This method was worked out through investigations definitely directed to that end. Another million dollars a year is undoubtedly saved to the citrus growers of California and Texas through the more economical icing of cars in transit; and as much more to the pear growers of the Pacific Coast through precooling, heavier loading, and the use of refrigeration methods in transit that resulted from our transportation and handling studies. Only a year or so ago the retiring president of the American Phytopathological Society placed the saving to growers through the use of our disease-resistant varieties of lettuce and cantaloups at approximately eighteen million dollars a year! This, you understand, is not the value of the crop, but merely an estimate of the increased annual return over and above what could reasonably have been expected where the ordinary susceptible varieties were grown. In other words, a single year's increased return from the disease-resistant lettuce and the mildew-resistant cantaloups, will practically offset the cost to tax payers of all Federal horticultural investigations from their initiation to the present time!

These thoughts are induced by seeing the notes of an informal talk Mr. Gould gave on our work, at a joint meeting of the American Pomological Society and the Tennessee State Horticultural Society some months ago. Possessing infinitely more modesty than the editor of the News Letter, Mr. Gould touched but lightly on the accomplishments of the Division, and went on to tell the meeting something of our organization and its activities. Since, as in the earlier part of this discussion, the tendency has been to speak of accomplishments and touch lightly on organization matters, some of the information presented by Mr. Gould will likely come as interesting news to you.

The Department of Agriculture, he pointed out, is divided into a couple of dozen units, groups or bureaus--the Secretary's Office, Bureau of Animal Industry, Bureau of Dairy Industry, Bureau of Entomology and Plant Quarantine, Weather Bureau, Forest Service, Soil Conservation Service, and others, including the Bureau of Plant Industry, the work of which deals with plants, crop production and closely related subjects.

In turn these Bureaus are composed of Divisions, each Division dealing with certain closely related phases of the work of the Bureau. For example, the Bureau of Plant Industry consists of about 14 Divisions, such as the Division of Cereal Crops and Diseases, Division of Forage Crops and Diseases, Division of Dry Land Agriculture, which deals with crop production problems in the Great Plains area, the Division of Irrigation Agriculture, which operates in the irrigated regions of the country and cooperates closely with the great irrigation projects of the Department of the Interior, the Division of Forest Pathology, and others, including the Division of Fruit and Vegetable Crops and Diseases. The name suggests in part the crops with which our Division deals, but it also includes work with ornamental plants, florists stocks, landscape gardening, etc.

Thus, the basic organization set up is: The Department, the Bureau, the Division. But in turn, the work of the Division is organized, logically about certain crops or activities. The Division of Fruit and Vegetable Crops and Diseases divides rather naturally into 9 sections: (1) Deciduous fruit investigations; (2) citrus, avocado and other subtropical fruit investigations; (3) nut investigations; (4) vegetable investigations; (5) floricultural and ornamental horticultural plant investigations; (6) nursery stock and shelterbelt investigations; (7) potato investigations; (8) investigations of methods of handling, transportation and storage, and market diseases of fruits, vegetables and flowers; and (9) investigations of varietal suitability and quality in relation to fruit and vegetable utilization.

In these nine groups we have some 450 distinct research problems that are receiving attention. In our divisional personnel there are from 400 to 500 or more people, depending on the season of the year. About 170 to 180 of this number comprise the research staff. Some 40 more are in what is known as the subprofessional group; about 80 are in the clerical group; the others are agents, laborers, etc. Most of the laborers are located at our field stations, the number varying with seasonal activities. The largest concentration of personnel is at the U. S. Horticultural Station, Beltsville, Md., about 15 miles from Washington, towards Baltimore. This is a new station, established a few years ago, but considerable progress has been made in the construction of laboratories, greenhouses and other buildings, and in establishing experimental orchards, vegetable plots, ornamental plantings, etc. The station now comprises about 700 acres.

Besides Washington and vicinity, investigations are being carried on at about 45 different field stations, field laboratories, and field offices throughout the country. In addition, certain lines of work are being conducted in cooperation with State experiment stations. For instance, deciduous fruit breeding is in cooperation with six or eight State stations; 13 States cooperate in the work of the U. S. Regional Vegetable Breeding Laboratory at Charleston, S. Car.; and our potato breeding work is on a national scale, in cooperation with 15 or 16 different experiment stations in most of the important potato producing States.

NUT INVESTIGATIONS

John H. Painter, Cairo, Ga. (Tung Investigations)

"On the night of February 22 the temperature dropped to 23°F. and again on the following night it went still lower to 21°," he writes for the week ending February 25th. "As a result of these two nights of freezing weather some scouting was done in this area and at Lamont, Fla. It was felt that an optimistic estimate of the damage done is 75 percent loss. Not being able to do very much in the tops of the trees, it is possible that this figure may be high but based on the actual number of buds examined within reach of the ground the figure is low. Dr. Potter and Dr. Sell spent the last day of this period at this station and assisted in determining the loss."

He had written February 18th: "In a grove near Tallahassee, Fla. several trees that had previously been marked by the manager of the estate as noticeably late bloomers were examined and appear to be running true to form this year. They bore a crop of fruit last year. In all previous findings of similar trees that were much later in blooming no fruit resulted. It seems that this characteristic is going to be one that will play an important part in the tung industry. The exceptionally warm weather encountered here at this station is bringing the buds out too fast to be safe and it is hard to believe that no real cold weather will yet be experienced."

Ernest Angelo, Bogalusa, La. (Tung Investigations)

"Minimum temperatures of 23°F. and 28°, respectively, were recorded at our weather station on February 23 and 24. Some time was spent in studying the buds in the tung orchards following these drops in temperature, and severe damage was observed," he writes February 25th.

He had written February 18th: "In connection with the study being made of the percent of fill, the size of fruit, the percent of nut and meat, etc. of the fruits from selected tung trees, an 'equalizer' was constructed and set into operation. This apparatus consists of a large garbage can through the lid of which there has been bored a hole to receive the shaft of a 6-inch electric fan. The fan is on the inside of the lid with the motor on the outside. The bottom and sides (up to a distance of 6 inches) of the can were painted with melted beeswax. A saturated water solution of calcium chloride was then placed in the bottom of the can. A wood strip support or platform was then built on wooden pegs and placed in the bottom of the can with the support clearing the surface of the solution. Hardware cloth trays were constructed so as to hold two samples of 25 tung fruits each. The trays are stacked upon each other in the can, there being space for from 7 to 8, depending upon the size of the tung fruits. When the lid is placed upon the can and the motor started, a draft of air circulates through the can over the calcium chloride solution and at the end of 3 days the samples are found to have reached a constant weight."

NUT INVESTIGATIONS

C. E. Schuster, Corvallis, Oreg.

"Pollination of filberts was completed some time ago," he reports February 18th. "It looks like a very good blooming season, as there have been considerable periods of time during which any one of the pollenizers could be shedding pollen freely. The early varieties were shedding pollen around the middle of January, while the midseason varieties had practically finished by the first part of February and the late varieties followed shortly after that. This refers to pollenizers for the Barcelona. On a trip to Washington State we noted that they were somewhat later and that the pollenizer for the DuChilly had not even begun to swell the catkins. The pistillate flowers on the DuChilly were just protruding through the bud scales. It will probably be the end of the month or a little later before the pollination of the DuChilly is completed. We found that there has been a decided let-up in planting filberts in western Washington. Results have not been too satisfactory with so many of the growers."

Paul W. Miller, Corvallis, Oreg.

"From all indications we are going to have an early spring in western Oregon this year," he writes February 25th. "Violets, snowdrops, and crocuses are now in bloom and early varieties of narcissi are on the verge of blooming. A large percentage of the pistillate flowers of the Barcelona variety of filberts are in the early postbloom stage. In 1938 a comparable stage of development was not reached until about March 4 and in 1937 it was March 15 before the same stage of development was reached."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Geo. P. Hoffmann

"Cover crops and ornamental shrubs are making pretty and satisfactory growth," he writes February 25th. "The cold wave during the middle of the week killed the blooms of the purple magnolia and reduced what was a plant of extreme beauty to winter stems and branches."

N. H. Loomis (Small fruit investigations)

"During the first part of the week several peach trees were observed in full bloom; however, freezing weather killed them and continued cold has prevented further development...February 18th the following grapes were checked as dead or but a vine left out of 10 after a five-year test: Agawam, Bachman Early, Beta, Brilliant, Campbell Early (10 of 20 vines), Clinton, Golden Muscat, Mericadel, Moyer, Niagara, (10 of 20 vines), Ontario, Regal, Salem, Sheridan and Urbana.

Atherton C. Gossard (nut fruit investigations)

"A cold wave took the temperature to 24°F. the mornings of February 22 and 23, but apparently did not damage the pecan or chestnut trees. The tung buds are beginning to swell, and an occasional bud has been injured or killed. Otherwise mild temperatures and abundant rainfall have been beneficial to the cover crop of vetch and Austrian peas in our pecan orchard..."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga. (U.S. Pecan Field Station and Laboratory)

"One day was spent by the staff in attendance at the annual meeting of the Southeastern Pecan Growers Association at Monticello, Fla." he reports for the week ending February 25th. "Three papers were presented by the men from this Laboratory. As a whole the meeting was very successful and all the papers presented were well received. A free fish* dinner was served at noon at the home of one of the Monticello pecan growers. The afternoon session was made up for the most part of a discussion of marketing problems with the report of the Pecan Stabilization Association receiving the greatest attention. One independent distributor was somewhat incensed over the results as he was prevented from shipping any nuts to foreign markets other than Canada and as a result he made less money. However, all the growers were much pleased with their increased returns and the firmness of the market and gave the independent distributor little or no sympathy.

"Cold, freezing weather the middle and latter part of the week caused an undetermined amount of injury to peaches, pears, and small garden plants. It is hoped that all peach buds were not killed but they were in a rather tender stage of development. A small amount of rainfall was recorded."

B. G. Sitton, Shreveport, La.

"Rains have continued and the soil is saturated so that it is impossible to do any field work," he writes from the U. S. Pecan Field Station on February 25th, reporting that they have had 4.00 inches since February 10--and a total of 19.86 for January and February."

F. N. Dodge, Shreveport, La.

"This year the adjoining neighbor planted soybeans the full length of the south side of the station. Since this plant is known to be host to the stink bug, counts have been made of the amount of stink bug injury to the nuts in the Cultural Experiment.

"Results of the counts show that the stink bug preferred Schley to either Success or Stuart; and hardly cared for the Stuart at all. This was interesting because the bugs had to pass the Stuart trees to get to the Success, and had to pass both the Success and Stuart to get to the Schley trees. Schley nuts from trees closest to the soybeans had 100 spots per pound of nuts, and those from Schley trees 400 feet more distance from the Soybeans had 40 spots per pound of nuts. Success had about 75 percent as many injuries as Schley, and Stuart nuts had too few injuries to justify counting."

*The J. R. Winston influence! (JAF)

FREEZING HELPFUL IN EVALUATING CHANGES IN VEGETABLES AFTER HARVESTING

It is difficult to compare the cooking quality of fresh vegetables if the cooking is done at different times, as for example when different varieties mature or after they have been subjected to various after-harvesting treatments. Dr. J. M. Lutz suggests that the difficulty can be avoided by freezing these commodities at the desired, but possibly widely separated times, and then cooking them all at some later date when they can all be tested at once. With peas, lima beans and other vegetables which lend themselves to this method of preservation it enables one to evaluate the changes in eating quality which may be induced by the various after harvest treatments or storage conditions to which they may be subjected prior to freezing. Samples cooked after freezing storage have been found to possess the same characteristics found in similar material cooked at the time frozen. The vegetables may be cooked whenever it is convenient, all samples of a given experiment may be cooked and compared with each other, and samples taken at the time of harvest as well as at intervals during the storage period can be observed at the same time.

One of the chief objects of physical and chemical methods used in determining quality changes in vegetables after harvesting is to determine the palatability of the product from the standpoint of the consumer. Cooking the fresh products and making organoleptic tests would aid in accomplishing this purpose, but in studying after-harvest changes such tests have been found difficult. The most important difficulty, perhaps, is that a person's standard of judgment might vary during the interval between the beginning and end of the storage period. Unless the observer sampled and compared two lots at the same time he would often be unable to say definitely whether any changes in quality had actually taken place. Another obstacle is the difficulty in securing a satisfactory panel of judges at all times during the course of an experiment; and another drawback is that rush of work sometimes makes it difficult to find time to cook and judge the samples. Thus, some method of preserving the samples for future observation appears desirable.

Chemical and physical determinations cannot always be relied upon to give accurate information on characteristics such as color, texture, and flavor of certain vegetables after cooking as influenced by after-harvest treatment of the products. In order to make direct comparison of vegetables in experiments such as those involving determination of quality before storage and at intervals during storage, Dr. Lutz suggests that the products be frozen (after proper preparatory treatment) and stored at freezing temperatures until they are to be cooked.

This method, of course, is applicable only to vegetables that can be frozen successfully, and is not suggested as a substitute for chemical and physical methods in exactly evaluating physiological changes but rather as a supplement to them when it can be used, since it furnishes a means of demonstrating whether or not changes detected by precise analytical methods have any practical significance from the standpoint of the consumer.

DECIDUOUS FRUIT INVESTIGATIONS

Elmer Snyder, Fresno, Calif.

"Vine 'bleeding' was noted during the week on some freshly pruned grapevines," he reports February 25th. "The bleeding of vines at this date denotes some growth starting activity, formation of new rootlets, absorption of water, and expansion of cell sap due to rising day temperatures following cool nights. Day temperatures have been approximating 70°F. with night temperatures slightly below 40°. Buds on small seedlings planted last fall show considerable swelling, bursting of bud scales, and on some seedlings the buds are in the woolly stage.

"Although February normally is our month of greatest rainfall, only .93 of an inch has been recorded at the vineyard for February up to the 25th. Our seasonal rainfall to date is 5.27 inches, considerably below the normal but somewhat comparable to our 1934 season."

C. O. Hesse, Davis, Calif.

"The past week has been clear and warm, with plenty of our famous northwind," he writes concerning the week ending February 18th. "This has dried things out pretty thoroughly, and the warmer temperature has forced the buds along considerably. Harriot almond is in bloom and others--No Plus, IXL--not far behind. I noted that Milo Wood's original 8-31 and 8-32 trees were in full bloom over the weekend. The apricots are still a week to ten days away, but they moved quite a bit the last half of the week.

"With only 4.18 inches rainfall at Davis and 6.10 at Sacramento, this year is, to date, the driest since the 1870's. Experience has shown that we can get lots of rain in March, but the trend seems to be on the dry side this year, and I expect things will continue that way. Some growers are applying an irrigation at this time to make up for the lack of rain. The grain farmers will undoubtedly be badly hit unless we do get considerably more rain."

John C. Dunegan, Fayetteville, Ark.

"A minimum temperature of 7°F. was recorded during the early part of the week ending February 25, but the cold wave was followed by warmer weather and rain. Prof. J. R. Cooper of the Department of Horticulture reported in the local paper a reduction of 30 to 40 percent in the cherry crops as the result of the low temperatures the first part of the week. He stated in addition that the apples, grapes and strawberries apparently escaped injury but there was some killing of peach buds, though not enough to materially reduce the yield."

DECIDUOUS FRUIT INVESTIGATIONS

John H. Weinberger, Fort Valley, Ga.

"The past week has been relatively warm with temperatures in the upper seventies on three different days," he writes February 20th. "Flower buds on peach trees are developing rapidly, and Hiley orchards in this section have a scattering of open blooms, possibly one or two percent. Early Rose buds are slightly swollen, but Mayflower trees are still dormant. We have now had 955 hours of cold, slightly below average for this date. About 200 more hours are normally to be expected."

NEW FRUIT PRODUCTS

Dr. D. K. Tressler of the New York Experiment Station predicts a bright future for the fruit industry, if the widespread interest in the development of new uses for fruits and fruit products shown by research workers in Government and State laboratories and in private industry can be taken as an indication of what may be expected during the next 10 years, says the American Agriculturist for February 18th, quoted in our Daily Digest of February 23d.

He predicts that canned and bottled apple and cherry juices will become important year-round beverages within the next decade and that the production of these juices will utilize millions of bushels of first and second grade apples and cherries.

Frozen sliced apples and apple flakes or apple flour for the baker are expected, he says, to absorb large quantities of apples.

The introduction of quick freezing units and cold storages by farmers operating roadside stands, he believes, is already within the realm of possibility, and, coupled with an increasing use of cold storage lockers, means that more and more fruit will be preserved for use either by the farmer and his family or for sale out of season to his customers.

W. R. BEATTIE HONORED

Mr. W. R. Beattie, who puts in approximately 24 hours each day (with time out for sleep) in connection with his radio work for the Division and the Department, plus the handling of his voluminous correspondence in connection with vegetable growing problems, has in some mysterious way found time to do such conspicuous work for his Citizens' Association that he has been selected to receive the Evening Star trophy for outstanding civic work.

The committee of the Prince George County Federation of Citizen Associations (Maryland) appointed to make the award, announced on March 2 its selection of Mr. Beattie for the honor.

FRUIT JUICE INDUSTRY

The rapid growth of the fruit juice industries in the past nine years, from a production of little more than 1,000,000 cases in 1929 to about 24,000,000 cases during the last year, is the subject of a special article in an issue of the Agricultural Situation, monthly publication of the Bureau of Agricultural Economics, quoted in the New York Times.

"America drinks its fruit," says Gordon Ockey of the Federal Bureau, reporting that "during the fiscal year 1937-38 the American people probably drank 80,000,000 gallons of canned fruit juices, not including sizable quantities of sweet apple cider, more than 50,000,000 gallons of canned tomato juice and about 60,000,000 gallons of wine made from grapes produced in this country."

Ockey says that prior to 1929 grape juice and sweet apple cider were the only unfermented fruit juices consumed in significant quantities. Little tomato juice was then consumed and commercial production of grapefruit juice, pineapple juice, orange juice, lemon juice and various nectars was yet to be developed. In contrast, almost 24,000,000 cases of fruit juices were packed last year, and more than 16,000,000 cases of tomato juice.

---Daily Digest

SHAMEL COMMENDED

In a discussion of work on lemon rootstocks by workers of the University of California, the Daily Digest calls attention to a word or so of commendation for our associate, A. D. Shamel. These California Experiment Station workers have been using the Eureka and Lisbon lemon. Their report in the California Citrograph for March says that the rootstocks came from single trees of these varieties. "The Eureka strain traces back to a single tree planted in 1904 near Corona," say the authors. "...This strain of Eureka was selected as suitable for the experiments because it is a true-to-type Eureka tree...It is the type of Eureka strain which has become the predominating one of this variety in California, owing in large measure to the commendable efforts of A. D. Shamel and his co-workers and to the Fruit Growers Supply Company."

LOST TRANSPORTATION REQUESTS

Lost or stolen transportation requests should be reported to the Business Office promptly. Give the numbers of such requests as well as the numbers of the books in which they were contained. In the event transportation requests which have been reported as lost or stolen should be recovered, they should be sent to the Business Office for cancellation and filing.

ADMINISTRATIVE NOTES

Toll Charges Apparently we are well on the way to a discontinuance of toll charges over the San Francisco - Oakland Bay Bridge. A compromise agreement submitted by the California Bridge Authority was accepted by the Attorney General December 16, 1938. It recognizes the right to free passage of members of the military, navel and civilian personnel of the United States and their dependents, resident or employed or having official business on Yerba Buena (Goat) Island, or on any vessel berthed at any point on said Island. "Official Business," of course, does not include trips for private business or social purposes!

Since some form of identification, or token, will be necessary, a meeting has been arranged to see whether some simple and orderly system can be worked out for dealing with this matter locally, including if feasible uniform blanks or tickets for all branches of the Department. Dr. L. I. Hewes, Deputy Chief Engineer of the Bureau of Public Roads, San Francisco, Calif., is the Department's representative in connection with this matter. Employees interested should get in touch with his office to learn the proper procedure in connection with travel over the bridge.

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Eight-hour Limitation The 8-hour work limitation law is applicable to every public contract otherwise within its terms which may require the employment of labor by hand or tools for its performance, and where doubt exists as to whether there may be involved such employment the requirement of the law should be inserted in the contract.

A distinction is made in that contracts for the demolition of structures, removal of a portion thereof, and cleaning up the area from which the structures are removed are subject to the 8-hour work limitation--but contracts covering the sale, demolition and removal of the Government-owned structures are not. The work of such removal is considered merely incidental to the sale and so wholly for the benefit of the contractor.

In the same way, contracts for supplies or equipment to be installed by the contractor where the article is purchased in a finished state at a fixed price and installation is merely incidental to the purchase, are also outside the limitations of the 8-hour law.

Contracts relative to agricultural pursuits that may require or involve the employment of farm laborers by the contractors should include the stipulations required by the 8-hour law; but where the contract is one of purchase of a harvested crop, and the harvesting merely a condition precedent and incidental to the delivery, the stipulation need not be included.

LEASES AND AGREEMENTS

The time again approaches for the renewal of leases and cooperative agreements, as well as obtaining new informal rental contracts for the fiscal year 1940. This means checking up NOW on all requirements for the new fiscal year, and deciding definitely just which agreements should be retained and those that may be terminated. There have been instances where it appeared there would be no necessity for continuing certain contracts during the next fiscal year and termination notices were mailed, only to discover later that it was all a mistake, and necessitating the execution of new agreements.

In view of the time and the various actions involved in obtaining the approval and preparation of a lease or cooperative agreement, or even the termination thereof, careful consideration should be given each contract. If a new lease or cooperative agreement is anticipated, first obtain instructions from the Business Office as to procedure. There are frequent changes in the requirements and inasmuch as they must be strictly adhered to, it is essential that one know how to proceed before taking any steps whatsoever. The required data should be accompanied by a summary form (which will be furnished by the Business Office upon request), giving complete and definite details, including the items of cooperation, or object of the lease, correct amount of rental, and the final option date. The latter item is particularly important, in that occasionally the duration of a lease or cooperative agreement is not sufficient to effect completion of the investigational work involved, and a new agreement is necessitated.

Short term rental agreements must be obtained for all services, such as rental of garage space, experimental plots, equipment, greenhouse space, and laundry service, garbage disposal, and ice, that extend regularly over a period of more than six months: but where the annual rental exceeds the rate of \$50.00, bids must be obtained.

In every case, before negotiating arrangements for rental of space or services that will require rental agreements or bids, or if you are in doubt as to whether you should obtain a rental agreement, consult the Business Office on methods of procedure. It has occurred rather often that arrangements have been made for the delivery of ice, laundry service, etc., or even rental of garage space, without the knowledge of the Business Office, until the vouchers were checked and information finally received that the services were to be continued. Then it has become necessary to secure contracts for these items, dating them back to the beginning of the rental period. This involves not only explanations to the General Accounting Office but jeopardizes approval of the contracts. If, on the other hand, the rental period is to be less than six months, a note should be attached to each voucher explaining that the service is to be temporary.

Telephone contracts no longer require annual renewal, nor do utility contracts, for gas, water, and electricity, except in rare instances when a company insists upon renewing its contract at the beginning of each fiscal year.

IVAN C. JAGGER

The death of Ivan Claude Jagger in a sanitorium at San Diego, Calif., on February 16, 1939, again serves to emphasize the fact that the Federal service contains numerous employees who are soldiers in the best sense of the term—working steadily and earnestly without any thought of personal acclaim or monetary reward. Jagger worked too hard and too industriously for his own good, and did this in spite of continuous warnings from his friends and associates. He had been troubled by asthma for some years and had suffered an attack of tuberculosis which forced him to enter the sanitarium. He seemed to be making excellent progress toward recovery when complications developed that resulted in his death.

Mr. Jagger was born at East Palmyra, N. Y. on August 12, 1889. He received his M. S. degree from Cornell University where he also nearly completed the requirements for the Doctor degree. He served as instructor in plant pathology at Cornell for about two years, and after a term or so as assistant professor of plant pathology at Rochester University, through a cooperative arrangement with Cornell, he came to us in 1918. Even then, not yet 30, he was recognized as one of the leading authorities on the diseases of truck crops in the United States.

Announcing his death, the New York Packer for February 25, 1939 states truly that Mr. Jagger was "one of the most skilled and practical scientists of his group, and perhaps the best known and most highly revered pathologist in the commercial vegetable and melon production districts of the West. For his incomparable work in the development of disease-resistant strains of Iceberg lettuce, and for his almost magical results in producing a mildew-resistant cantaloup, Mr. Jagger has long since been regarded more as a master magician than a worker with plants by the hardened, practical grower-shippers of the Imperial Valley and other western producing sections. While he would have been the last to take credit for these seeming miracles and whereas he has worked hand-in-hand with the University of California, his Department colleagues, and the industry itself in twice saving perishable producers when they appeared doomed to ruin by pests and diseases, it cannot be denied that his skill and his patience were the chief attributes in turning back the enemy of plant disease...."

"His contributions to the produce industry were by no means confined to Imperial valley and virtually all strains of lettuce now being grown commercially, not only in the West but also in New York and other Iceberg producing sections, originated in his laboratory, the test plot. Utterly devoid of any thought of commercial gain for himself, Mr. Jagger is nevertheless rightfully credited with having the outstanding characteristic, aside from his almost magical scientific skill, of sensing the commercial possibilities of the plant with which he worked and of appreciating to the fullest extent the practical problems of the commercial grower....The produce industry pauses to pay its highest respects to a great and practical scientist, whose contributions cannot be measured in tangibles."

Vol. 11 No. 6

March 15, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

NUT INVESTIGATIONS

Milo N. Wood, Sacramento, Calif.

"Most of the field work during this time has consisted of the taking of blooming records and the continuation of the floral biology studies," he writes for the three weeks ending March 11th.

"At this time the early blooming varieties of almonds at Davis have dropped their petals. The latest varieties are still in full bloom. The blooming period, as was to be expected from the weather we have had during the winter and spring, is different from that which we commonly have during average years. The early varieties and the late varieties are blooming much closer together than is common. This is especially marked in the early and late blooming hybrid trees in the breeding tract. We have had an unprecedented spell of dry weather until last week. During last week we had good soaking rains. Many of the growers were worried for fear that the rains will interfere with the proper pollination. However, if clear weather follows the rains will not do as much damage as was expected. Previously, however, we have had some very strong, cold north winds which prevented bees from working in the orchards. While the over-lapping periods of bloom of the varieties are very favorable from a pollination standpoint, the north winds have caused considerable interference by preventing the bees from working and, therefore, the pollinating season has not been altogether satisfactory. As is usual, the growers have not worried about the north winds but have been concerned about the rains. Although most of the weather has been unfavorable to pollination, it seems probable that there were enough sunshiny days scattered throughout the blooming period to enable the bees to accomplish sufficient pollination for the setting of fruit in most almond orchards....There has been much interest manifested in planting almonds and we have had more inquiries than ever before in regard to the various factors to be considered in almond planting. I understand that all the nursery companies are sold out of almond trees and therefore there will be no late spring plantings made."

Paul W. Miller, Corvallis, Oreg.

"Preliminary results of studies on the critical period for the infection of filbert buds by the filbert blight pathogen were taken during the week," he writes March 4th. "Young, opening shoots from the buds on potted trees inoculated in the late summer and early fall of 1938 by atomizing on pure water suspensions of the blight organism are now 'blighting' in a relatively large percentage of cases. Only a relatively small percentage of buds inoculated in the late fall and early winter of 1938 show signs of infection to date. Results of these studies corroborate the results of field studies and prove that early fall is the most critical period for the infection of filbert buds by the filbert blight pathogen."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

"The chestnut trees at Philema are beginning to put out new growth," he writes from the U. S. Pecan Field Station and Laboratory of March 18th. "Pecan buds are swelling but show no green color as yet. The rye cover crop is heading and will require cutting before very long. Vetch also shows considerable development."

He had written earlier that the rye under the "high N" trees in the nutritional experiments was much advanced over all the rest and showed the presence of a good supply of nitrogen in the soil under these trees. The lupine plants that survived the freezes and what appeared to be a damping-off disease were making good growth and showing flower spikes. "Strains resistant to these troubles will need to be developed before this plant will be promising for use as a cover crop in this section," he wrote March 11th. "Bur clover is making good growth at Philema this year and shows no injury from the freeze and the latter part of February. Our planting of Augusta vetch is looking well and the stand is better this year than last. Kudzu is showing numerous new shoots."

He had written March 4th: "The main topic of discussion in this section of the country this week was the weather. The best characterization of it can be made by saying that we had our share of it! From about midnight Saturday, February 25 to Friday, March 3, we received more than 8 inches of rainfall of which a little more than 4 inches fell early Sunday morning. At Albany winds of a velocity estimated at better than 50 miles an hour accompanied this heavy rain, and about 50 miles west of Albany a tornado caused much property loss and a few deaths. There is more water in and on the surface of the soil now than has been observed for some years. Roads were badly washed and the road to Philema was impassible until the middle of the week....No damage at Philema resulted from the wind, other than a slight amount of limb breakage in the old seedling trees. Temperatures during the week were about normal."

John R. Cole, Albany, Ga.

"A large number of nursery trees were sold during the year and reliable reports indicate that the varieties were purchased by growers in this order: Stuart first, Schley second, and Success third," he writes in his report for the week ending March 18th. "One broker purchased 10,000 trees--7,500 Stuart and 2,500 Schley--for planting in North Georgia. The Stuart is very resistant to the scab disease, while the Schley and Success are very susceptible."

"We are finding some interesting fungi associated with the storage rot of chestnuts. We have not definitely identified all of those fungi."

NUT INVESTIGATIONS

Felix S. LaGasse, Gainesville, Fla. (Tung investigations)

"The most important happening this season throughout the tung belt was the severe frost damage to tung buds, blossoms, and in some instances actual killing nearly to the ground of 1-year-old trees, that occurred in the Gainesville area on the mornings of February 23 and 24," says the joint report of Messrs. LaGasse, Sell and Nelson, dated March 4th. "Some few trees had 50 percent of their blossoms open the Sunday previous (19th), although on many there was but an open blossom here and there, or a branch which seemed to be somewhat ahead of the rest of the tree in blossoming.

"There had been little change in the appearance of the blossoming condition of the trees when the frosts of the 23d and 24th hit them, so that the majority of the flower buds were killed without ever expanding. Dr. Potter had just come from the western areas of the tung belt, and he commented that we were several days in advance with respect to time of blossoming. The temperatures occurring around Gainesville varied from place to place but lows of 19° to 26° were recorded at several places. The Alachua Tung Oil grove showed the 19° temperature. From some recent observations made at Mr. Bennett's in areas somewhat higher and with better air drainage to the lake, it appears that more fruit buds escaped complete killing than was at first reported, although it is still, of course, too early to tell just how much their functioning ability may have been impaired, even though they were not frozen completely. In comparison to peach, plum, and pear blossoms in the same areas and which were much more advanced, the tung blossoms showed a very much greater percent of injury from the low temperatures occurring,

"Examination of young trees with respect to injury shows tremendous variation both from grove to grove and within groves. At an orchard being developed just west of Alachua many of the trees showed injury extending from the tip to the ground; others only at the tip. At another planting considerable injury occurred in the low areas, but the planting as a whole escaped with much less injury than the one previously mentioned.

"It is certainly very evident that a hardier type of tung tree is needed in this area. Whether such a tree will be secured through selection or breeding, with respect to actual hardiness or with respect to a more completely dormant type, seems not of so much importance, but got it we really must. It seems to me that this season offers an unusual opportunity to select individuals that are already inherently blessed with these characteristics. I believe a survey of the whole tung region this season for the selection of such individuals would prove to be a very profitable procedure, and one of which we should avail ourselves."

NUT INVESTIGATIONS

F. N. Dodge, Shreveport, La.

"Nelson, Van Deman and Moore pecan trees showed their first noticeable signs of bud swelling this week," he writes from the U. S. Pecan Field Station on March 18th. "No other varieties have shown this as yet. In the past four years Nelson has been the first variety to begin growth in the spring. Bud swelling on pecans on this station is two weeks later this year than it was in 1938; one week later than in 1937; and is occurring at the same time this year as it did in 1936....."

"Cover crop samples were cut on the two cotton plots this week. These showed that the plot on the clay soil had produced 7,000 pounds of green weight per acre, while the plot on the mixed clay and loam soil produced 11,000 pounds per acre. Melilotus indica is continuing to make better growth than vetch."

B. G. Sitton, Shreveport, La.

"Some evidence of bud swelling was noticed during the week ending March 4th on early varieties of peaches. Pears were in full bloom and some even shedding the petals, while peaches were coming into bloom. Rainfall for January and February was nearly double the average for these two months, there being an excess of more than 8 inches over the average."

John H. Painter, Cairo, Ga. (Tung investigations)

"A more detailed study of the freeze injury was made this period," he writes for the week ending March 18th. "In the only commercial tung nursery in this area the estimated damage was 50 percent; that is, one half of the seedling trees were rendered unfit for sale. This figure more or less agrees with the estimate previously made by this station--that 60 percent were killed back to a height of not over 6 inches, of which 20 percent were killed to the ground. Too, some injury was noticed in mature orchards on terminal growth that was at all weak."

"In regard to the bloom: It is now discovered that the original estimate of damage, 75 percent, is pretty accurate for the whole district, but splitting the district into Georgia and Florida the damage will have to be estimated at 10 percent higher than originally stated in Georgia and from 10 to 15 percent lower in Florida (based on the Lamont planting). Parts of the Lamont planting are completely gone, but other parts have a strong 25 to 40 percent crop left. The air drainage has played quite a part in preventing damage but there still is quite evident a difference within individual seedlings, noticeable both at Lamont and, especially, in Georgia."

NUT INVESTIGATIONS

John H. Painter (continued)

"The entire week ending March 11 was spent in the field. The first nursery planting was started March 7 and by the 11th about 36,000 seed had been planted....As a result of conferences with growers who have had experience in planting nurseries, different ideas were sifted and out of all it was decided to use 18 inches between the seeds in the row and 4 feet between rows. Considerable difference of opinion has been evident as to the correct depth to plant the seed. It was generally thought that at this time of year it would be better not to plant deeper than 3 inches, in spite of the common recommendation of 4. The seeds in this nursery were as far as possible planted from 2-1/2 to 3 inches deep."

HANDLING, TRANSPORTATION AND STORAGE, AND MARKET DISEASE INVESTIGATIONS

Edwin Smith, Wenatchee, Wash.

"The price of Delicious apples has increased recently," he writes under date of March 8th. "Desirable sizes of Extra Fancy in good condition have sold for \$1.60 f.o.b., and some owners are asking \$1.75. It is unfortunate that these favorable returns are made so late in the season because it encourages future long-holding of this variety. Instead of having the economic stimulus which encourages the marketing of this variety when it is either immature or in a stale 'quality senescence' it needs a stimulus which would result in a heavier consumption during November, December and January."

"North Central Washington is now attempting to raise \$500,000 from merchants, professional men and business related to the fruit industry, such as paper, box and spray material manufacturers, to be used as a capital stock 'back log' whereby borrowings may be made from the Government to the extent of \$6,000,000. These borrowings would be used for grower financing on a new basis. Instead of emergency loans to help a grower operate from season to season without much consideration for the more permanent needs of his orchard and economic production, the loans would be made with more consideration for rehabilitation or elimination of orchard and orchardist over a five year period. As agencies of the Federal Farm Credit Administration have expressed their unwillingness to repeat their losses with further loans unless improved marketing facilities are developed, this plan is tied up with the formation of a Tree Fruit Cooperative Association (headquarters across the hall in former quarters of the Whatchee Valley Traffic Association). While this is a grower organization it does not propose actually to market fruit but proposes to license "marketers" who may be private, corporate or cooperative and to supervise quotations, short-selling, etc. If these projects are not carried out it is difficult to foresee where several hundred growers in North Central Washington will secure funds to sustain themselves and families between now and the next harvest season."

DECIDUOUS FRUIT INVESTIGATIONS

J. R. Kienholz, Hood River, Oreg.

"A typical specimen of stony pit on Bosc pear limbs was received from the horticultural inspector at Yakima, Wash. He asked how the disease might be controlled. I hope it will be possible to make a preliminary survey of the Yakima, Wenatchee and Medford districts this summer to determine the severity of the disease in these places. It is especially desired to determine the extent of the trouble in the Anjou variety and whether there is a clear-cut difference between it and the trouble called drought spot. If leaf symptoms can be developed by budding or grafting in the nursery, several of these confusing questions should be cleared up. With this point in mind, about 400 young Bartlett seedlings have been bench-grafted during the past week with several varieties which showed what is believed to be leaf symptoms of stony pit in the field. These healthy seedlings will later be budded or grafted with diseased stock to see if the same leaf symptoms appear in nursery trees.

"Terminals have been cut back on the trees budded last fall to force the diseased buds inserted, into growth. Several other trees have been dehorned, to determine if the leaf symptoms will appear on the young succulent growth of diseased trees....

"Pear-buds have been swelling, but recent cold weather and snow has slowed them down considerably," he writes, March 1. "This is welcome, for otherwise we would be about three weeks ahead of last year. However, the mild winter has allowed growers to make rapid progress with spring work, and as a result pruning work is fairly well along or finished."

R. B. Wilcox, Pemberton, N. J.

In a summary of observations in connection with the cranberry season that closed late in October, he writes:

"The New Jersey crop, estimated by the American Cranberry Exchange at 55,000 barrels, was the smallest in years. Many factors contributed to this result. There was an inevitable reaction from the large crop of 1937; spring frosts damaged some bogs; heavy rains during the blooming season curtailed the set of fruit; and floods later in the summer did some direct damage and undoubtedly increased the proportion of rotten fruit. The early and mid-season varieties of cranberries were shipped by the middle of November, with only those cranberries intended for the Christmas market being held by the growers."

DECIDUOUS FRUIT INVESTIGATIONS

Claron O. Hesse, Davis, Calif.

"The past week has continued 'fair and warm,' with light to strong winds every day," he reported February 28th.

"With February drawing to a close we have had practically no rain all month, and only about 4-1/2" for the season, compared to a normal rainfall of about 12" for this date. This unusual weather (the driest year to date since the 1870's) is apparently going to mean disaster to the grain farmers. Some fields in this vicinity are already drying, and are hardly far enough along to make pasture.

"Fruit growers are faced with an unusual problem in that the orchards are dry with the blooming period at hand. Most of the almond orchards are in full bloom or a little past now, so that irrigation is being practised rather generally. The weather trend appears to be on the dry side for some time to come, so they undoubtedly feel safe in skipping the brown rot spray. In addition, relatively few of the almond growers head their orchards, so the question of possible frost is not involved.

"The apricot growers, on the other hand, are facing a real dilemma, and all of them seem to be playing their hunches as to the best way to handle their trees. Some are irrigating now, and taking chances on the brown rot and frost injury, while others are holding off on the irrigation. However, there is real danger that the set will be low on unirrigated orchards because the soil is really very dry. It will be interesting to watch the orchards treated differently, as the season progresses."

Elmer Snyder, Fresno, Calif.

"Grape seedlings resulting from the 1938 breeding work were transplanted from flats to paper pots and gallon cans during the first week of March," he writes March 11th.

"A summary of the seedlings obtained indicates that for each 100 emasculations 31 seeds were obtained, which resulted in 19 seedlings.

"Buds will be taken later from the more vigorous seedlings to "T"-bud into the top growth of root stocks which were planted in the spring of 1938 for this purpose. Plans were made last season to "T"-bud at least 500 seedlings of the more promising 1938 crosses for a quicker fruit reading. Judging from the present growth of the seedlings, we should be able to "T"-bud about the latter part of April."

DECIDUOUS FRUIT INVESTIGATIONS

Lee M. Hutchins, Brownwood, Tex. (Fruit Tree Virus Diseases)

"Favored by good weather the past week, all hands have been busy in the propagating room and nurseries, and we have accomplished a great deal," he reports March 11th. "Dormant season inoculation experiments have been set up on virus diseases, including 2 new ones as yet undescribed and some that are still undetermined as to cause. We have planted several hundred trees for our own use during the summer, and for use in our cooperative project with the Bureau of Entomology and Plant Quarantine on vector work in connection with peach mosaic.

"The pumping station at the Bayou has worked out beautifully. A rotary pump was installed some months ago and is operated by a tractor easily put into position when needed. This pump will fill a one thousand gallon tank, mounted on running gear, in 3-1/2 minutes. The outlet is near our nurseries, and as everything has to be watered when planted, this has been a great saving to us over filling the tank with city water near the laboratory buildings. A long haul is saved and it required 20 minutes to fill the tank from the city hydrant.... Hiley trees are approaching full bloom in our nurseries and leaf buds are starting on most of the smaller trees of all varieties."

MEASLES ON DISEASED APPLE TREE

John C. Dunegan reports from Fayetteville, Ark. for the week ending March 4th, an interesting find in the form of a very extensive development of measles on York Imperial which was so badly affected with black root rot that the tree was pushed over and broken off with little difficulty. "This development of measles on a diseased tree when measles could not be found on adjacent healthy trees is most interesting," he comments.

ADMINISTRATIVE NOTES

Telegrams Walter Roney says he has just received notice of a change in the regulations affecting the use of the telegraph. When necessary to forward telegrams from the point of original address in future, the messages will be forwarded at regular Government rates for the class of service involved. This, says Walter, is just one more reason why telegraph service should not be used unless the exigencies--exigencies, that's his word!--of the service require a speedier mode of communication than ordinary mail or airmail afford. When telegraphic service is required the sender should be careful to select the cheapest form of service, considering time of delivery and importance of the message.

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Geo. P. Hoffman (Vegetable Crop Investigations)

"The season's first or clean-up cutting of asparagus was made on Monday, March 13, with the first individual plant and plot detailed record cuttings following on Friday and Saturday for treatments 2 and 3, and 1 and 6, respectively," he reports March 18th. "The quantity and quality of grass is very satisfactory. Apparently, the heavy application of barnyard manure applied last spring is reflecting good in the approaching crop this spring.

"Sweetpotato bedding in this section is well under way and there is every indication that bedding quantities have been well in line with evidence of heavy plantings and plant sales.

"Reports from the Laurel Starch Plant area indicate much increase in acreage anticipated."

He had written March 11th: "The asparagus cutting season is right on our heels. Nice spears are rapidly appearing here and there over the field, and it is interesting to observe that the block which was not cut at all the first year following planting shows a greater number of early appearing spears than are seen on the blocks even lightly cut....

"The previously referred to lot of weeds and grass put through a hammer mill during September and bedded down in a compost heap shows much favorable promise. This material is being used in our potting soil at this time and combines to make what appears to be a very satisfactory medium in which to grow plants. This material has the advantage of being more nearly free from root knot than does leaf mold obtained in this section."

Weather for the week ending March 18th was representative of both spring and late winter, with maximum temperatures ranging from 57° to 84°F., and minimums from 33° to 62°.

H. N. Loomis (Small Fruit investigations)

"The Boysenberry canes were severely injured by the February freeze," he reported March 4th, "while the Youngberry canes, both Thorny and Thornless, were only slightly injured. This will probably make a great difference in the yields this year."

Dormant spray (4-4-50 bordeloux) was put on the grapes and brambles the week ending March 18th. All the necessary replants were made in the peach and pear orchards and in the muscadine vineyards. Fourteen varieties of "bunch" grapes were replaced by new varieties. The new strawberry planting was also made.

WHY FRUIT TREES FAIL TO BEAR

"Many amateur fruit growers are concerned at times because their trees do not begin to bear as soon after being planted as they had expected or do not bear as abundantly as they wish," says Leaflet No. 172, "Why Fruit Trees Fail to Bear," by H. P. Gould, just issued. "In some cases after bearing for a period of years the trees cease to produce, or bear irregularly."

These amateur fruit growers by no means suffer in silence. They take up their pens or pencils and write to ask us what is wrong with the trees. Unfortunately only about 1 letter in 10 contains sufficient information to enable us to supply information specific enough to be helpful--until we write for it. In self defense, then, Mr. Gould has prepared this leaflet.

"When fruit trees, planted singly or in small groups, fail to bear as the owner has hoped, he is likely to want to know why," says an excellent review of the publication, sent out to newspapers by the Press Service on March 19th. "Age, species and variety of tree, temperature and moisture conditions, distance from other trees of the same kind but of a different variety as required for cross-pollination, fertility of the soil, pruning practices followed, and the presence of insect or fungus pests--all affect bearing.

"To help amateur growers," says the release, "the Federal Bureau of Plant Industry has just prepared Leaflet 172, Why Fruit Trees Fail to Bear. With this leaflet, by H. P. Gould, many an owner will be able to answer for himself some of his questions on nonbearing. If he cannot, he will be better prepared to write for information, giving in his first letter more of the facts the specialist will need to form an opinion as to what is wrong and the remedy. Leaflet 172 may be obtained by writing to the Department of Agriculture, Washington, D. C. It is not intended for commercial growers.

"Mr. Gould finds that one of the commonest reasons for disappointment is expecting a crop too soon. Most varieties of apples, for example, do not bear in the East until 6 or 7 years after planting. A few varieties, well cared for, may bear in 4 or 5 years. Others may need longer. Pears bear at about the same age as apples--Kieffer pears earlier. Peaches commonly bear by the fourth year if weather conditions are favorable.

"The leaflet explains the effects of severe cold which may kill the bud and prevent bloom, or may kill only the embryo, allowing full bloom but little or no fruit. Some fruits are self-fertile and isolated trees will bear. Many, however, require cross fertilization by bees.... Moisture supply, pruning, bearing in alternate years, fertilization, and other conditions affecting bearing are discussed briefly."

ADMINISTRATIVE NOTES

Alcohol All purchases of alcohol for laboratory use should be made through the Washington office, where it can be obtained free of tax at a very low price per gallon.

In the past, attempts to purchase alcohol in the field, free of tax, have invariably failed since form 1094, tax exemption certificate, cannot be used for such purposes. There is a special alcohol tax exemption certificate (Form 1444) but as a rule the Collector of Internal Revenue issues these permits to the Department for withdrawal of alcohol free of tax only during the period of a contract with producers or sales agents. Therefore, all who have occasion to purchase alcohol for official use should see that the supply on hand is sufficient to meet their requirements until replenishment can be made from Washington, D. C. so that no "emergency" purchase need be made in the field. Of course every precaution should be observed in the storing of alcohol to prevent improper use and reduce fire hazards to a minimum.

Leave We want to again call attention to that paragraph in the Leave Regulations which says:

"Notification of absences on account of illness shall be given as soon as possible on the first day of absence," or

"Such absence may be charged to annual leave or leave without pay. Application for sick leave shall be filed within two days after return to duty."

When circumstances prevent compliance with the above, an explanation should accompany the leave application.

It is important also that all leave slips be forwarded promptly to Washington, D. C. through the section leaders. In a few instances annual leave slips have been held until the employee returned to duty before they were submitted. This often prevents proper action, approval and recording, and may lead to disapproval with consequent charging of such absence to leave without pay.

Just a warning that regulations are made to be complied with--perhaps you'd better open up the Regulations to Paragraphs 2511 and 2521 and read them again--carefully!

 MANUSCRIPT HEADINGS

Bureau of Plant Industry Memorandum No. 489, dated March 31, 1929, outlined two headings, either of which would be acceptable and one of which must be used on all mimeographed and informal circulars and memoranda to be distributed to the public and where indication of authorship was desirable:

1. FOUNDATION PLANTINGS

By Furman Lloyd Mulford, Associate Horticulturist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture:

 2. UNITED STATES DEPARTMENT OF AGRICULTURE
 Bureau of Plant Industry

FOUNDATION PLANTINGS

By Furman Lloyd Mulford, Associate Horticulturist, Division of Fruit and Vegetable Crops and Diseases.

 The second form is desirable for mimeographed and other circulars since they are usually prepared on plain paper and this form furnishes proper departmental and bureau identification. For the sake of uniformity, we have been using the second form also on manuscripts prepared for outside publication. However, we are finding that a good many of these outside journals appear to regard the heading much as they would a letter-head and ignore it in crediting authorship. Some of our contributions to these journals, as a result, have appeared without any mention of the Bureau or the Department!

Under the circumstances it has been decided to retain the second form of heading for mimeographed and other processed, ateroas--but to use the first form on manuscripts intended for outside publication. Please see, then, that all manuscripts offered for publication in outside journals are headed in accordance with the first form shown above.

Vouchers Attention is again invited to the fact that the signature on a voucher should correspond with the name as written in the heading. If a voucher is made out in favor of "John B. Doe" it should be signed that way, and not merely "J. B. Doe." One made out in favor of "Mrs. John B. Doe," should have the "Mrs." indicated in the signature, and not be signed merely "John B. Doe." The payee's certificate on vouchers made out in the name of a firm or cooperation, of course, should be executed in agreement with the name as shown in the caption, per an authorized representative: For example: THE JOHN DOE COMPANY, per Richard Roe, Treasurer.

Vol. 11 No. 7

April 1, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI

Washington, D. C., April 15, 1939

No. 8

Science and
the Farmer

In a discussion of scientific research and the farmer-- "Bringing Science to the Farm" -Planning (London) in its issue of October 18, 1938, suggests that the relationship

between the research worker and the farmer is dual; not only does the farmer need the help of the specialist, that is, but the scientist needs contact with the farmer. "A research worker who has achieved an important piece of research is likely to feel acutely discouraged if remediable circumstances prevent its use by the farmers," Planning points out.

Research workers should not merely be familiar with things about farming that may be learned from textbooks or by attending lectures, but should have a familiarity with those practical phases of the subject that can be learned only by contact with the soil and with farmers-- features that may vary from county to county, from farm to farm, or even from field to field.

Educational services, Planning believes, are the most fundamental link between research and practice. Education, too, is the key to the psychological problem that confronts the popularizers of scientific agricultural knowledge, it insists. "The crux of the dissemination problem is less the inculcation of new knowledge than the spreading what is already common knowledge among the scientifically minded, but which the ingrained caution of the farmer distrusts as new-fangled," it says. "This psychological difficulty appears to be due, not to congenital mental dullness among farmers, but to an inability to adapt themselves, arising from a variety of social and economic factors...."

It is this desirability of having laboratory and administrative headquarters located in the center of greenhouse and field experiments that makes such a station as Beltsville of the greatest potential value to the horticultural industries of the country.

However, this in no way minimizes the vital place that research in pure science must always hold in the efficient advance of agriculture. The history of agriculture shows that many, if not most, of the greatest advances have rested on the discoveries of research specialists in laboratories and greenhouses rather than on the experience of farmers. Too, as the Secretary has pointed out, the Department was created primarily for scientific research, and its main job always has been research, and it is hoped that research will always remain its principal duty no matter how many emergency tasks may be placed upon it.

Of course it is not enough to discover facts, the Secretary has said. A public institution has also the obligation to see that the facts are made available to all who can profit by them. When a plant breeder in the Department develops a variety the job of the Department is not finished. The new variety must be tried out in various regions, in the field, and the results of such trials have to be made known to growers, propagating material made available, and so on.

As to pure science: A century or so ago, in England, Faraday was an experimental philosopher, a worker in pure science. He did not concern himself with the invention of machines or even with the practical application of his discoveries. He wanted to find out how Nature worked and in the course of his experiments hit upon the principle of electromagnetic induction. Without that discovery--pure science--we would today have no means of putting electrical energy to work. Without this pure research of Faraday, that is, your radio and electric lights would not be possible.

In our own field there is the work of Mendel. There is no evidence that Mendel had any idea of the far reaching practical results that would come from his research in plant breeding. He developed a principle which lay dormant for many years before its importance was sensed by any one, in fact. Now it has become the basis of all modern plant breeding, with all that implies. We know that Mendel's work has been of primary importance, that is, in improving varieties of practically every plant that helps feed or clothe us.

Scientists like Mendel and Faraday were working in what we call pure science, explained the Secretary. They were trying to discover Nature's fundamental secrets, but without thought of any practical application of their discoveries. Had some overzealous administrator tried to restrict their curiosity to some specific object, or to the immediate solution of some highly practical problem, we would have been deprived, in all probability, of their great discoveries.

Which is why our program has always been balanced between (1) investigations having immediate and practical objectives, and (2) pure research instituted to discover basic facts and principles for later use in working toward practical objectives.

BRUISING, FREEZING, AND CHEMICAL INJURY TO POTATOES IN TRANSIT

"Frequent complaints are received from produce dealers in various parts of the country because of damage to potatoes in sacks where they come in contact with the floor or the floor racks of the cars," says Technical Bulletin No. 668, "Bruising, Freezing, and Chemical Injury of Potatoes in Transit," by R. C. Wright of our section of handling, transportation and market disease investigations, just issued.

"During the winter the injury often is attributed to freezing; at other times it may be attributed to the action of salt, fertilizer, or other chemicals present on the floor or side walls of the car when it was loaded. Observations have shown that the injured potatoes in question have invariably come from the sides or ends of the sacks where they were pressed against the floor or side walls of the car.

"All such injured potatoes that have been examined have shown unmistakable signs of bruising, which varied from unbroken but flattened areas plainly showing the imprint of the bag to badly bruised areas. Injury of this type occurs only in potatoes loaded in sacks or in bulk. Since the custom of shipping in sacks rather than barrels has become increasingly prevalent in recent years, more attention has been called to bruising injury, which was not noted when potatoes were shipped in barrels. In some growing sections, bushel boxes or crates have recently come into rather general use as shipping containers. However, no transit injuries, such as described herein, have been reported in shipments made in these containers."

If potatoes are turgid or brittle the burlap may cut through the skin, causing the area to become wet. Newly dug potatoes are more turgid than old ones, and those from storage at relatively low temperatures (32° to 40°F.) are more brittle than those from higher storage temperatures. In simulated transit tests to determine the effect of storage treatment and tuber temperature on susceptibility to floor bruising 65 percent of the potatoes in lots that had been in storage at 32°F. for 3 months were injured, while only 31 percent of those from a 50° temperature were injured. In potatoes from a cellar storage averaging about 50°, and subsequently held for 3 days at 32° previous to the test, 54 percent were injured as compared with 31 percent in those held continuously at 50°. These tests demonstrated the relation between the temperature of potatoes and their susceptibility to injury when subjected to bruising. Transit bruising produced under experimental conditions were identical with that found under commercial conditions.

The bulletin summarizes the symptoms of injuries from floor bruising, freezing, and chemical injury.

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunegan, Fayetteville, Ark.

"Rain early the morning of the 26th and cool, rainy weather on the 27th and 28th apparently brought the moisture needed to hasten the maturation of the Venturia perithecia," he writes April 1. "Several were observed on the 28th on leaves which had been saturated in the orchards since the 26th. In addition to the perithecia showing the mature spores, a number of immature perithecia were also noted on the leaves. The rain the early part of the week also induced spore production on the 'cedar apples'--germinating teliospores were observed on the 29th on Gymnosporangium juniperi virginianae.

"The weather turned definitely cooler following the rain but the temperature did not drop to dangerous levels and rapidly returned to spring time levels as the week ends. The various apple varieties are now definitely advanced with the buds showing in tight clusters on the Jonathan, Ben Davis and Delicious, while those of the Winesap are less advanced. If the warm weather continues over the week end the coming week will initiate the 1939 spray season.

"Fully expanded Schlerotinia fructicola apothecia were found in the orchards on the 28th. Red Bird peach trees and other early maturing varieties are now in full bloom, while Elberta trees have shed their petals and are beginning to leaf out."

He had written March 25th: "The temperatures have returned to spring-like levels again. Plum trees are in full bloom, peaches will be in full bloom in a few days, and the Delicious and Stayman Winesap buds show definite swelling. An examination of our experimental plots showed that the Winesap trees were not advancing very rapidly but slight indication of growth was visible. If this warm weather continues the spray operations will probably start during the first week in April.

"An examination of peach mummies on March 21 showed several groups of small but expanded apothecia and many others showing very definite signs of advancement. Peach buds in the orchard where these mummies were located were almost open and it is evident that apothecial and blossom bud development are closely synchronized this season. With ascospores being discharged this week, conditions are 'all set' for the development of blossom blight when the next rain occurs."

C. O. Hesse, Davis, Calif.

"The past week has been exceptionally warm, and the result has been a rapid opening of the bloom of all fruits," he writes March 21. "Apricots and Japanese plums are gone or were in full bloom by the end of the week. The normal lag in bloom between the Japanese and European plums seems to be considerably extended this year, but the warm weather is bringing the European group out rapidly now. The majority of the peaches burst into bloom this week."

DECIDUOUS FRUIT INVESTIGATIONS

E. S. Degman, Medford, Oreg.

"Spring hit us with a bang on March 16, when the maximum temperature was 73, with temperatures from that to 78 during each day since," he writes March 20th. "As a result the buds are moving rapidly and have overcome the 10-day lag as compared to last year....We have the smudge oil in place and expect to put the dormant lime-sulphur spray on, starting tomorrow.

"We have nearly finished measuring the 1938 shoot growth and the results are quite surprising. Shoot growth over the entire orchard, regardless of experimental treatment is greater than in the previous years. In 'Frequent-Cultivated,' for example, with no change in the irrigation treatment, 1938 shoot growth was 2.3 times as great as the 1937 shoot growth. These same trees carried nearly twice as many fruits in 1938 as in 1937. The greater amount of growth was the result of a combination of more shoots and longer shoots.

"In trying to find out why the better set of fruit last year and why the better growth of trees, we can find only two things which were different from previous years: (1) The spring of 1938 was exceptionally wet. (If this had anything to do with it, our plots receiving heavy irrigations during and immediately following bloom should show us something this year. To date it looks like a dry spring); (2) the dormant spray was applied rather early in 1938. There appears now to be somewhat of a correlation between the earliness of application of the spray and set last year. We have no data on growth. While it is rather questionable that there is connection here, we thought it worth a little investigation."

R. B. Wilcox, Pemberton, N. J.

"A few cranberry bogs are being sanded; otherwise there is no activity on the bogs," he reports March 16th. "Blueberry fruit buds are much swollen, but have not burst their scales; the leaf buds have not started. Growers are putting the finishing touches on their pruning.

"Mummies of the Sclerotinia disease have become active, but spores are not yet mature. 'Horns' were evident on a few mummies by the 18th, but suffered a setback; by the 25th a few apothecial bulbs had appeared, but there has not been much advance since that time. We have looked at them daily, but the time has not quite arrived for most effective sweeping or spraying; sweeping will probably start in some fields next week. We now expect to spray blueberries by the 3d with bordeaux; one field was sprayed with lime-sulphur on the 25th and we will follow this up with bordeaux mixture after the buds start."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Geo. P. Hoffman

"Strawberry growers are busy getting in crates and making preparations for the handling of the approaching harvest," he reports April 3. "Fields appear promising. Reports from the Louisiana berry district indicate that very satisfactory yields are being harvested and good prices up to the past few days have been had, but the market has broken with resulting unsettled conditions."

"Peach orchards here and there appear promising with apparent increased interest. Pecan trees are breaking bud rapidly in this section and in the Jackson-Crystal Springs section are some farther advanced. Farmers of both the general and special crop producers are very busy with the work day hardly long enough."

He had written March 25th: "Asparagus cutting is progressing in a very satisfactory manner. Treatment 6, spring and fall cutting, is giving very low total yields and the 'grass' is of small size and the quality generally poor. Sweetpotato bedding was started and will soon be behind us. The potatoes have kept in fine shape--only a small percentage of soft rot here and there. Tomato plants are about large enough to go to the field but ground and weather are not warm enough to risk field planting now. Our plants are the best that we have every grown--hard and stocky. Reports from Crystal Springs indicate that a few tomatoes here and there are going to the fields..cabbage a bit behind."

N. H. Loomis (Small fruit investigations)

"A few strawberries are ripening," he writes April 3d, "but it will be another week before there will be many in the station planting. The peak crop will probably come between April 15 and 30th. It is probable that a partial car will be shipped from the Marion strawberry section April 7th or 8th. During the week ending March 25th, 384 seedling grape vines were planted in the test vineyard for fruiting; and approximately 245 smaller vines were left in the nursery for another year. All fruit plants were fertilized."

J. M. Lutz (Handling, transportation, storage and utilization)

Experiments were started during the week ending March 25th on the handling and storage of asparagus.

"An examination of berry and muscadine juices was also made during the week. Thomas resulted in distinctly the best grape juice, with Scuppernong next. James and Flowers were decidedly inferior. Both Youngberry and Boysenberry juices were of very high quality."

NUT INVESTIGATIONS

Milo N. Wood, Sacramento, Calif.

"During the week ending March 25th I concentrated upon collecting the final data on the almond blooming in the breeding plot in Field 6. Owing to the recent warm weather the late varieties bloomed rapidly and most of them are now--March 25th--finished. Even the late varieties will be through blooming ahead of any previous year that I recall. The Reams almond, which is the latest blooming commercial variety grown on the University Farm finished early, its last blossoms being gone some three weeks before our late trees began to bloom. Last year some of these late trees were fully six weeks after the Reams. Texas and Languedoc rank next in lateness to the Reams, while our latest varieties this year bloomed some four weeks after Texas and Languedoc. In ordinary seasons our late blooming hybrid trees would not be out for several weeks yet--this year the almond blooming season began late and ended very early."

He had written March 18th: "Blooming data has been collected largely with the object of ascertaining varieties most suited for interplanting with our new Jordanolo and Harpareil varieties for pollinating purposes. Our pollination experiments conducted over a period of several years show that the Jordanolo and Harpareil are intersterile with each other. Pollination experiments conducted to see whether incompatibility existed between the Jordanolo and Harpareil varieties and most of the commercial varieties show that all are interfertile with the two new hybrids. In conducting the pollination experiments early blooming and late blooming varieties were tested as interpollinators of the Jordanolo and Harpareil and while all were compatible it is clear that the periods of bloom of some of the commercial varieties are such as not to overlap properly with Jordanolo and Harpareil.

"In some seasons the Peerless and Nonpareil interpollinate satisfactorily with both Jordanolo and Harpareil, while such late blooming varieties as the Texas sometimes lap over in bloom with the Harpareil but seldom with the Jordanolo. Drake in some seasons and in some districts will pollinate Harpareil to a certain extent and occasionally the Jordanolo. In some districts in the Valley, too, the Jordanolo and Nonpareil pollinate each other to a certain extent. The Harpareil even interpollinated with the late-blooming Drake in some instances. In a number of districts, however, the Jordanolo and Nonpareil did not coincide enough in their periods of bloom to pollinate each other from a commercial standpoint.

"In practically all the Sacramento Valley much more rain is needed; without it the yield and quality of almonds will suffer in non-irrigated orchards. Many growers are irrigating. Irrigation is advisable at this time where water can be had. The average rainfall has been so slight that some growers find that where wells are used as a source of supply the water is lower in them now than is generally the case in the fall after a heavy pumping season.

NUT INVESTIGATIONS

Milo N. Wood, Sacramento, Calif.

(continued)

"There have been some frosty nights in portions of the Sacramento Valley. Some almond growers have already lit the smudge pots on four separate occasions. Several growers have purchased wind machines as a means of frost protection and this should be a good year to see what the machines will do.

"This will also be a good year to test out the 'toughness' of the Harpareil and Jordanolo almonds which are early bloomers. I think that no doubt the frost will reduce the crop on these trees in some sections, although many of the growers state that for some reason or other the pistils of these two hybrid varieties are not as easily injured as are those of some of the commercial varieties. This would be rather too much to expect and the data upon which such opinions are based is probably not accurate. However, in one of the districts where the almond orchards bloomed rather early, pistils of the Jordanolo and Harpareil did not seem to be injured while those of the Peerless, I.X.L. and Nonpareil were dropping from the effects of the frost."

Max B. Hardy, Albany, Ga.

"The work of planting out the chestnuts bench-grafted and healed in six weeks previously was completed on Tuesday, and on Wednesday morning additional bench grafts were made and the grafted trees planted directly in the nursery row," he writes from the U. S. Pecan Field Station on April 1. "Notes on the early grafted trees showed that untreated cotton wrapping string disintegrated too soon to hold the stock and scion tight until union had occurred. Waxed cotton wrapping string gives indication of about proper longevity. Waxed cloth was good as far as resistance to rotting and protection of the graft union was concerned. Parafilm G tape over untreated cotton wrapping string had changed but little in appearance and there was relatively little callus tissue at the graft union. Most of the scions which showed swelling of the buds were found on those grafts wrapped with waxed cloth and waxed string...."

"While on a trip to Monticello, Fla. for getting our Crotalaria seed scarified and looking over the orchards in that locality, a trip was made to the Chase tung orchard in Lamont, Fla. Observations were made on the cold injury and it was estimated that there was not over 30 percent of a full bloom and further, that the cold had apparently injured the pistillate flowers to such an extent that not much over 10 percent of a crop can be expected. Many trees that appeared to have a fairly good bloom from a distance showed but very few or no pistillate flowers on close inspection....."

"Around Albany the pecan trees have made rather remarkable development during the past week, so much so that the first spraying will be required after about one more week unless a temperature drop occurs. Catkins on trees of the Moneymaker variety are about two inches long and Schley catkins are distinct. Trees of most varieties are beginning to cast some shade but the Stuart is not so advanced."

NUT INVESTIGATIONS

C. L. Smith, Brownwood, Tex.

"During this week trees in cover crop plots at Wharton were measured and the cover crop growth checked up," he writes March 18th. "The yellow flowering sweet clover is again much earlier than hairy vetch and Hubam clover. On the average, the sweet clover is more than two feet high and is just beginning to blossom. The Hubam clover is about 10 to 12 inches high, while the hairy vetch is still prostrate on the ground. There are lots of thistles in the plots and these grow vigorously during the winter and have crowded the vetch to a considerable extent, whereas the sweet clover has crowded out the thistles so that they have done no harm to it. For this reason and the earliness and heavy tonnage, it certainly looks as though the sweet clover will be preferable to hairy vetch or Hubam as a cover crop for pecan orchards."

ADMINISTRATIVE NOTES

Military In connection with membership in military or naval organizations the Department regulations provide that the appointment of an employee as an officer in the Officers' Reserve Corps, Marine Corps Reserve, National Guard, or Naval Reserve shall not become effective unless and until approved by the Secretary.

Employees desiring approval of such appointments must make a request through Mr. Gould for approval. As a rule requests of this nature will be approved, and notice of such approval forwarded in duplicate to the chief of bureau concerned. The employee will be given the original of the notice of approval in order that it may be forwarded to the Department in which the appointment originated. No restrictions are imposed by the Department on membership in other Federal or State military or naval organizations, of course.

Where an employee is recommended for appointment, and is already a member of the Officers' Reserve Corps, for example, an application should be forwarded immediately requesting permission to retain the commission, this application to be sent through Mr. Gould to the Chief of Bureau who will forward it to the Secretary's office for approval. We cannot grant military leave to an officer of the Reserve Corps until approval of his membership in the Corps has been given by the Secretary.

It would be well for section leaders and station superintendents to check up on this and have any members of their staffs coming within the scope of these regulations file applications immediately if their membership in the Officers' Reserve Corps, etc. has not yet received the formal approval of the Secretary.

LOWLY CABBAGE GLORIFIED BY "TREASURE ISLAND" LANDSCAPE ARTIST

The possibility that the lowly cabbage may ultimately be selected as the beauty to wear the badge of "Miss Horticulture" will come as no surprise to Dr. Boswell, of course, but I do hope that some one will call the attention of Dr. J. C. Walker to the item I am quoting below. He is the Pygmalion who has been modeling this Galatea of the vegetable kingdom!

"Selina Peake, city born heroine of Edna Ferber's great story, 'So Big,' married Dirk De Jong, hulking, inarticulate Dutch market gardener, to learn that he lived above the drudgery of his acres only because he thought 'cabbages is beautiful'" says Western Grower and Shipper for March, 1939. "As the years passed, Selina too saw beauty in the colorful pattern of the market gardens.

"Something of the same feeling must have motivated the selection of cabbage as bedding plants for a half mile of border along the Garden Walk on Treasure Island, by Julius Girod, Director of Horticulture for the Golden Gate International Exposition. The first planting which greets the eye of visitors coming by ferry from San Francisco, over 10,000 cabbage plants and several hundred beets are represented in this unique border. Director Girod has used both green (Savoy or Crinkly) cabbage and a red variety in well spaced color bands enclosed in a three foot edging of common garden beets...."

ADMINISTRATIVE NOTE

Freight "We are just in receipt of a notice from the Division of Purchase, Sales and Traffic of additional information on freight classification to be called for in all requests for bids where prices are solicited f.o.b. shipping point," writes Walter Roney. The following paragraphs should be incorporated in all such bids:

"Bidder is requested to make appropriate entries in the blank spaces below relative to freight classification of the material called for in this invitation:

As described in accordance with Consolidated Freight Classification No. _____, Page _____ Item _____

If the above classification reference carries more than one rating due to difference in methods of packing, state how goods will be packed for shipment: _____"

- - - - -

Twine While such appointments have "strings" to them, as indicated, there is also a coming event that appears to be casting its shadow before it in connection with string itself! The Agricultural Appropriation Act as recently passed by the House of Representatives, for example, carries the following provision:

"PROVIDED FURTHER, that no part of the funds appropriated by this Act shall be expended in the purchase of twine manufactured from commodities or materials produced outside of the United States."

ADMINISTRATIVE NOTES

Field Stations The particular attention of all field employees should be called to Amendment 80 of the Department Regulations, December 19, 1938, says Dr. Auchter in BPI Memo. 1027 of March 21, 1939.

"This amendment includes paragraphs numbers 2911, 2912, 2913 and 2914 of the Department Regulations dealing with the general subject of investigations of field stations and investigations of specific irregularities. It is believed that field investigations by the Department staff can be mutually helpful to the Department and the Bureau. With a view to insuring full cooperation and a proper appreciation of the respective fields of the Department investigators and the employees of the Bureau, the following suggestions are given:

1. Persons introducing themselves as representatives of the Division of Investigations of the Department should be required to produce proper credentials establishing their identity and official capacity.

2. On proper identification investigators should be given full cooperation, including access to fiscal....and other records, and the best available information on any questions that they may ask.

3. The advice and suggestions of the investigators should be welcomed, and forwarded to the Chief of Bureau through the Division Head, with any comment the station superintendent might care to make; however, no changes in records or procedure should be put into effect following the suggestions until Bureau approval has been secured....

4. Immediately after the visit of a representative of the Division of Investigations, the head of the field station visited should submit to the Chief of Bureau, through the head of his own Division, a full report of the investigator's visit, indicating particularly the name of the investigator, the date of his visit, the points covered by his investigation, the matters to which particular attention and discussion were given, any weak or strong points which may have developed in the procedure or records of the field station, and any specific comments, criticisms, or suggestions made by the investigator. The comment of the station head as to the mutual helpfulness of the investigator's visit also is invited.

5. All station accounts or records must be kept in such a way as to be available for inspection at any time, as for good and obvious reasons, investigators probably will not give advance notice of their arrival.

6. Responsible field officials are instructed particularly to observe the provisions of Paragraph 2912 which require the reporting to the Chief of Bureau of alleged misconduct, neglected duty, or irregularities on the part of employees. It is appreciated that station heads are reluctant to report matters which may appear trivial. It must be remembered, however, that important consequences sometimes develop from seemingly insignificant things and it is therefore requested that this regulation be strictly observed. Failure to report apparently small irregularities which later become serious, is likely to cause embarrassment both to the Bureau and to the head of the station at which the incident occurs.

Vol. 11 No. 8

April 15, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI

Washington, D. C., May 1, 1939.

No. 9

DECIDUOUS FRUIT INVESTIGATIONS

Pears J. R. Kienholz contributes from Hood River, Oreg. April 1 a very interesting series of comments on the work under way at his station. "The prospects for a pear scab year still appear to be remote," he writes. "Not a single twig lesion has been found on pear terminals even on trees which received no spray last year. If growers will follow recommendations this season, it is believed scab can be reduced to the point where it will not be a serious problem again for several years. Our experimental plots will consist of one semi-commercial block in which the more promising materials will be tested, and a second plot to try some of the newer sprays on a small scale.

"Stony Pit of Pears. --Some 400 Bartlett seedlings have been bench-grafted to Bosc, Anjou, Forelle, Patten, and Quince to start a small nursery. Later in the year diseased Bosc material will be worked to these trees by various methods to determine if symptoms can be standardized for future stony pit work. The Patten and Forelle leaves have shown what is believed to be a good symptom, if the diseases on these varieties are finally proved to be stony pit. It is planned to determine as soon as possible if the Bartlett material budded with diseased Bosc buds previously is carrying the stony pit vitus or whether the tree is immune. The possibility of working badly diseased Bosc is not recommended, but slightly affected trees might be topworked to Bartlett if they prove to be immune. This information would be very opportune at this time, since the Bosc variety is not in good favor here and many growers are already working the stock to Bartlett. The recent discovery that stony pit is transmissible by building probably saved growers many dollars, since many of them would have worked the diseased Bosc to Anjou with the result that a diseased block of Anjou would have been on their hands in a few years time.

DECIDUOUS FRUIT INVESTIGATIONS

J. R. Kienholz (continued)

"Experiments with boron.--An ideal block of trees was obtained to test the effect of boron sprays on Black-end of Anjou," he continues. "This particular orchard showed a loss of approximately 2,000 boxes of fruit last year. The trees were all tagged, and the yield estimated at harvest time. The fruit on most trees was a total loss and not picked. Of these, we applied a 1200 gallon tank of borax on March 24 at the delayed dormant stage. Eleven other trees were soil treated on March 7 with 1 lb. of borax per tree, and 20 trees were left untreated for checks. About 70 trees were sprayed. The granular borax used was first dissolved in a small amount of warm water, but this settled out rapidly upon standing and it was found necessary to have a large volume of water to dissolve the crystals. About 15 minutes was required before the crystals were thoroughly dissolved in the tank with the agitator running, as determined by allowing the stream of the overflow pipe to run through partly closed fingers. No sludge was left in the tank, and Mr. Robinson, chemist of the Oregon State College, stated there would be no complications if mixed directly with lime-sulphur except a possible precipitation of sulphur if certain iso-electric points were reached in the mixture. This was my experience last season, so it was applied as a separate spray this year.

"A block of Delicious showing the pimply bark similar to that reported from Ohio was also treated. This block was interplanted with peach trees. A block of Yellow Newtown trees was treated in the Upper Valley to observe the effects in that district. Our plots at the Experiment Station were also continued, and we are increasing the dosage each year to determine when the material becomes toxic and how long the effects last.

"Another application was made to cherries, and several growers are cooperating in applying the borax to pure alfalfa stands. All in all, it has been quite a boron month--March. I was interested in finding that about 50 tons of borax have been applied to orchard trees in this district in the past two years.

"Cherry Diseases.--The 'black-knot' condition at the Dalles was again collected and isolations made. The same disappointing results were obtained. Some of the cankers collected appeared to be young and active, but no organism could be grown from the material. These isolations will be continued at intervals, but it appears from what I have seen and from talks with growers, that the trouble may spread only during certain seasons.

"Growing Conditions.--After some delay by snow flurries, the temperature suddenly rose. Three days recorded over 70 degrees. Apple buds which were tightly closed in the morning were showing green by afternoon on the first warm day. Ideal weather has continued during the past week and sprays are nearly all on. Anjou trees are about in the full pink at

DECIDUOUS FRUIT INVESTIGATIONS

J. R. Kienholz (continued)

this date, March 30. Night temperatures have gone down to 23 in a few orchards, but no injury has been seen here. However, reports are that apricots were injured at The Dalles. The orchards have not been examined since this cold snap.

"Market Conditions.--Several independent growers made some good sales during March. One grower sold 7 carloads of Anjou which averaged better than \$3.00 a box. The Apple Association sold most of its fruit early and the growers will not realize much from those sales. However, here is food for thought:

'A carload of Anjou pears delivered at San Francisco involves an investment by the grower of approximately \$1,000.00. The same fruit costs the consumer about \$3,600.00 on the retail market, leaving a tidy sum of \$2,600.00 per car for the middle man to play with. As an average, no matter if the grower receives 30 cents or \$2.00 per box f.o.b., the retail market still pays its 5 cents each for pears. Does it make much difference if costs are shaved at the producing end?'"

M. A. Smith, Columbia, Mo.

Writing from the U. S. Fruit Disease Laboratory on March 31st, he reports that the weather during the month of March was nearly ideal from the orchardist's standpoint.

"Peaches and plums are in full bloom. Pears will be in full bloom by the middle of the week. Apple buds are still fairly tight and even now would probably withstand a temperature of 22 degrees. It is very interesting to compare the stage of development of fruit buds now with the stage a year ago. In 1938 at this time peach trees had finished blooming. Apple trees were in full bloom on April 3, 1938. The disastrous results of the freeze of April 7, 1938 are well known. While peaches and pears are now at a stage where they can probably be injured severely by frost, fruit growers are optimistic regarding the apple crop.

"A number of examinations of overwintered scabbed leaves were made during February and March. Perithecia have been found to be very plentiful in most of the material examined. Asci were showing relatively little development on March 15th. Following the warm weather of March 20-25, a collection of leaves was examined on March 27th. This examination showed that perithecia were maturing rapidly. Asci containing mature ascospores were found in 80 percent of the perithecia examined."

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunagan, Fayetteville, Ark.

"The temperature dropped to 29°F. in the early morning hours of the 11th and grave fears were expressed for the safety of the fruit crop," he reports April 15th. "Fortunately this second return of winter weather was of very short duration and the apple crop seemingly has escaped without further injury....."

"The Arkansas 1939 strawberry crop was forecast today at 930,000 crates of 24 quarts each by Stuart L. Bryan, statistician of the Bureau of Agricultural Economics. April 1 reports, Bryan said, indicated an acreage of 16,900 acres with an average yield of 55 crates per acre. Production was expected to exceed that of 1938, although the yield per acre would be less. The survey did not take into consideration weather conditions since April 1. The freeze of April 6 is believed to have killed many of the blossom buds and the estimates when next released will probably show a marked reduction in the size of the crop."

He had written April 8th: "I left Fayetteville on April 6, following the receipt of a telegram from Mr. Gould, and spent all Friday and part of Saturday in the Nashville, Ark. peach section investigating the death of peach trees in that section. In the district as a whole, reliable growers estimate that 50,000 trees are dead or dying at the present time. The injury was typical of that seen in Georgia in years past and was diagnosed as winter injury. Many trees were examined and in every case it was found that the root system and branches were uninjured but the trunk and crotch were discolored. The trees had leafed out and were just beginning to collapse as the result of the dead tissues isolating the tops of the trees from the root system..."

"Following the rains on April 5, the temperatures continued to drop and a freeze was predicted for the night of the 6th. Temperatures in the Nashville area dropped to 30°F. while at Fayetteville a minimum of 25°F. was reported.

"As far as I could ascertain, the peach crop in the Nashville area was not injured and I examined many young peaches during the afternoon of the 7th. The story is quite different in northwest Arkansas, however. In this area the majority of peaches have been killed, all the plums, and there is a variable amount of damage to the sour cherries and apples. The Jonathar appears to be the variety most seriously injured, but we have extensive injury in our Ben Davis spray plots at Ruppel Bros. The cluster buds had separated in our plots and some blossoms were open. An examination of the trees indicates very little freezing on the petals but the pistil and

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunegan (continued)

stamens in many blossoms are collapsed and brown. The crop on our experimental trees is definitely reduced but we still have hopes that enough fruit will remain to furnish a basis for the experiment. We have applied the cluster bud spray in spite of the freeze and will make counts later this week to get more definite information on the size of the crop remaining on the trees.

"At Bentonville smudge fires were started in the cherry orchard of Fagan and Taft the night of the 6th. In addition to smudge pots, more than 500 old automobile tires were burned in the orchard. These burning tires produced huge clouds of smoke which hung over the orchard. I have not had time to visit the orchard but newspaper reports indicate that most of the cherry crop was saved.

"Here at Fayetteville, Mr. Prince, manager of the horticultural orchard, purchased 5,000 lbs. of old tires for \$8.00 and these were burned in the peach and apple blocks. One tire was used for every four peach trees, and two tires for every four apple trees. The fires were started about midnight and the tires kept burning until considerably after day-break. Mr. Prince feels that the fires in the orchard have saved a portion of the peach drop in their experimental blocks."

(Editorial Note.--We hope this matter of utilizing all of the automobile but the "squeal" doesn't get around too much, because there are here and there a number of elderly station cars the boys would like very much to find some excuse for setting afire! JAF)

Elmer Snyder, Fresno, Calif.

"I took a trip out west of Fresno yesterday to see some hail damage to some vineyard areas," he writes Mr. Gould on April 10th.

"Something over 2,500 acres of Thompson Seedless (Sultanina) vineyards were involved. The hail occurred on the night of April 1st. It cut the shoots from the vines just leaving short stubs of shoots. I counted a number of vines and the clusters left averaged from four to six to a vine. These same vines would ordinarily have from 60 to 100 clusters, so you can see it took most of the crops. Although we had some slight hail here, we suffered no injury to the experimental vineyard.

"In all my stay here, I have never seen this sort of hail damage. Although the injury was localized in a relatively small area, it will be hard on the growers thus injured."

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Wilcox, Pemberton, N. J.

"The weather was warm from the 10th to the 12th, with a maximum of 76° F. on the 11th," he reports April 15th. "However, the remainder of the week was cool, with temperature below freezing on three nights. A few magnolias are in bloom, otherwise there has been little apparent change in vegetation. Considerable damage to peach buds from cold has been reported and it is said that the red raspberries in the Hamonton District have suffered severely.

"Blueberry buds have been practically at a standstill. Sclerotinia mummies have continued to develop, however, and many of them have been discharging ascospores. Many blueberry fruit buds, though still covered by scales, appear to have been hurt by the low temperature, especially on the morning of the 9th, when the minimum was 30° F. at Pemberton. There seems to have been more damage in the Pemberton area than in some fields near the shore which are usually more subject to frost. There are no temperature readings available for blueberry fields, but it may be that the thermometer did not get quite so low near Toms River. Enough buds appear to have been hurt to reduce the crop in certain fields. On Thursday morning, the 13th, the temperature at Pemberton fell to 23°. This may possibly have done a little damage, although it is thought that the wind blew all night and thus prevented an actual frost in most places."

He had written April 8th: "The soil-water situation has become acute throughout South Jersey. The frequent rains have been so well distributed that there have been no floods, but the general water table is higher than it has been for many years. There are many slight depressions throughout the pine woods, on the very lightest soil, where I have never seen water standing before, but where there have now been extensive ponds for many weeks. On the heavier farming soils the high moisture content has prevented plowing and planting, and no early potatoes have yet been put in the ground. The low temperature and high moisture acting together have held vegetation at a standstill during the past week.

"Most of our time during the week ending April 8th was spent in blueberry fields working on the mummy berry disease. Ascospores were matured in a few of the most advanced apothecia during the week, but most of them have not yet reached that stage. Sweeping mummies from under the bushes was started on the 4th. We had intended to spray on the 3d, but the wind was too strong on both that and the following days. We applied a thorough spray of bordeaux mixture to a badly infected field on the afternoon of the 5th. This left the bushes covered with fungicide during the first possible period of light infection. It should not be necessary to put on a second application until the leaf buds have made some start."

DECIDUOUS FRUIT INVESTIGATIONS

E. S. Degman, Medford, Oreg.

"The warm spring weather has continued, and Anjou trees will be in full bloom about April 3, or 11 days earlier than in 1938," he predicts in his report for April 1. "Light frosts occurred the mornings of March 28, 29 and 30. The first night the Holmes Brothers (formerly known as the Rosenberg Brothers) were reported to have smudged a little. The last two mornings, smudging was fairly general in our section of the valley and we smudged from 4 to 6 o'clock each morning.

"The buds advanced so rapidly that we had to cut the strength of our delayed dormant spray the last day. March 31 we finished a combination 'pink' and 'white-bud' spray of wettable sulphur.

"Anjou trees have about a normal bloom this year, Bartlett trees are somewhat spotted, but with plenty of bloom in most orchards, Comice are reported light in most orchards, and Bosc quite light.

He had written March 11th: "The present price of Anjou pears is encouraging and tends to bear out the early-season optimism of some of the growers. The small profit on Anjou will not compensate for the loss taken on Bartlett and Bosc, however,

"An interesting observation was made recently in connection with the Bosc 'measles' disease. Last March, scion wood of Waite was secured from Prof. F. C. Reimer and brought to this station. The tree from which the wood was taken had some 'measles' but not bad, and an effort was made to avoid twigs actually showing the cankers. About half a dozen scions were placed on a young Old Home tree and a like number on vigorous shoots of a mature Bartlett tree about 50 feet away.

"This Spring at pruning time it was noted that every scion on the Old Home tree was badly infected with 'measles,' whereas not one on the Bartlett showed a single mark. The scions made a vigorous growth on both trees. It doesn't appear that chance alone would have caused such a remarkable distribution. Prof. Reimer said that the worst twigs on the Old Home were worse than anything he had ever seen on one-year-old Bosc wood. Samples were sent to Drs. Zeller and Kienholz. Prof. Reimer tells me that the tree at the Southern Oregon Experiment Station from which the scions were obtained has very little evidence of 'measles' this spring.

"Outdoor work is demanding attention now--March 11th--and we expect to start our growth measurements next week. The buds are about 8-10 days behind last year, which means a late blooming season unless warmer-than-normal weather occurs."

NUT INVESTIGATIONS

C. L. Smith, Brownwood, Tex.

"The cover crop on the station was turned under this week," he writes April 15th. "Although the yield was cut by dry weather the crop averages from 8 to 11 tons green weight per acre with about 30 percent dry matter content. We have had only 4.27 inches of rain since January first, and most of this has been showers of a quarter of an inch or less, and therefore has been worth little...."

"The Success pecan trees are just starting shoot growth here on the station whereas many Burkett shoots are 4 to 5 inches long. The Success variety is about two weeks later than Burkett in starting spring growth, while the Western Schley, Squirrels Delight, and Jersey are intermediate between the two."

F. N. Dodge, Shreveport (Robson), La.

A heavy frost occurred the morning of April 8th which injured the kudzu only slightly, but injured some tomato plants seriously. There was no apparent injury to pecans....Pecans are making growth in spite of the cool weather. I have observed pistillate blossoms on six varieties. This is occurring at approximately the same time this year that it did in 1936; but is one week earlier than in 1937, and two weeks later than in 1938.

"It is apparent that bordeaux spraying last year has influenced the early growth rate of several varieties. This difference is greatest with the varieties which were the most susceptible to summer defoliation. Moneymaker trees which have never received any bordeaux have almost no staminate bloom, while Moneymaker trees which have been sprayed with bordeaux the past two years have a heavy staminate bloom. A similar condition is apparent with Delmas, Van Deman, and Major. These are all varieties that are highly susceptible to summer defoliation. Staminate bloom is not far enough advanced on other susceptible varieties to see if this will be a general condition. However, it is only a repetition of the condition in 1938 with Stuart and Moneymaker following the application of bordeaux in 1937."

John R. Cole, Albany, Ga.

"Rain, wind and hail storms did considerable damage south of Albany on April 6th," he writes from the U. S. Pecan Disease Field Laboratory. "Five inches of rain, accompanied by hail, fell at Baconton in a short time, while tornadoes struck in the vicinity of Cairo. These disturbances were followed by much colder weather with light frosts forecast for North Georgia over the week end."

NEW INVESTIGATIONS

Max B. Handy, Albany, Ga.

"The writer, in company with Mr. J. R. Cole, made a two-day trip to Statesboro and Lyons, Ga. to talk at meetings of pecan growers at these places," he writes April 8th. "The trip was considered a successful one. At Statesboro between 50 and 60 pecan growers assembled for the talks which we gave and appeared very appreciative of the information made available. The county agent estimated that from 2,200 to 2,500 acres of pecans were represented by those in attendance.

"Heavy rains prevented the inspection of any orchards and also prevented a barbecue dinner which had been planned. General observation and discussion with individual growers showed a fair knowledge of proper pecan orchard management procedures. At Lyons, a small group of about 25 pecan growers assembled to hear our talks. Pecan growing around Lyons is apparently not as extensive as around Statesboro but the growers exhibited considerable interest in the subjects discussed."

Paul W. Millor, Corvallis, Oreg.

"Unseasonably warm weather continues to prevail in western Oregon," he writes April 8th. "No rain has fallen during the past week. It is now over a month since any measurable rainfall has occurred at Corvallis. The warm weather is forcing the development of walnuts as well as other tree fruits. The pistillate flowers on some early walnut seedlings and on certain early varieties of walnuts, such as the El Monte, are now in the late prebloom stage of development. Catkin buds on the Franquette variety are swollen appreciably and the leaf and pistillate flower bearing buds are breaking open. If the present unseasonably warm weather continues to prevail, spraying of grafted Franquette orchards will commence about the middle of the coming week."

Milo H. Wood, Sacramento, Calif.

"The actual field work in collecting blooming data on the almond hybrid trees is over," he reports April 1. "Considering the season, a number of the hybrid trees are the latest bloomers ever seen in California. A few of them bloomed fully a month later than the Reams, which is the latest blooming commercial variety in this part of the Sacramento Valley....The weather has been very dry. The trees are already suffering for lack of soil moisture. It will be a very bad year for sticktights unless we get more rain very soon. Even then the rainfall is so far below normal that I think we can safely say there will be a great quantity of sticktight almonds on the non-irrigated orchards this year...Cherries are in bloom and pears are now coming into bloom rapidly. The weather has been ideal for these species from a pollination standpoint."

NUT INVESTIGATIONS

Alton H. Finch, Tucson, Ariz.

"Buds on younger pecan trees in Arizona are beginning to break," he reports April 3d. "This is about the normal time and suggests that there will be little difficulty from delayed foliation. Fruit trees are breaking earlier than last year. Peaches in the Salt River valley are almost in full leaf now. However, some sprays of dinitro to peaches have been effective in causing buds to break early."

"Cool temperatures have prevailed for the past few weeks, which we believe is a good sign. In compiling records on pecan crops for the past eight years, a proportionately large number of hours below 45°F. during March and April has seemed to presage a good crop year."

C. E. Schuster, Corvallis, Oreg.

"The early walnuts are shedding pollen and filberts are coming into leaf quite rapidly," he writes April 8th. "The cherry crop is generally set at this time and most of the prunes are in full bloom. It can be considered an early season so far."

John H. Painter, Cairo, Ga. (Tung investigations)

"In a hurried visit to several of the nearby groves it was again made clear that the previous statement that there would be practically no crop in Georgia this year was pretty accurate," he reports April 8th. "Trees that were found to be blooming upon examination generally proved to be predominately male flowers."

He had written April 1: "A single tree was located today near Thomasville, Ga. that was 100 percent female. There were absolutely no male blossoms nor had there been any. There was no indication of any injury to the bloom of this tree and all fruits seemed to have been ready to set. In nearby trees, having both female and male blossoms, the female blooms were very scarce, seemingly having dropped prior to setting."

"It is thought by this station and others that the female blossom may be more susceptible to frost injury than the male, though it is hard to account for the failure to have injury in this tree which is all female bloom. The tree was marked and because of its unusual nature was shown to a local nurseryman who claims never to have seen such a tree before. It is a young tree and not exceptionally vigorous for its age, but shows promise of a better crop of fruit than much larger and more vigorous trees that are heavier in bloom but mostly male blossoms."

NUT INVESTIGATIONS

George F. Potter, Bogalusa, La. (Tung Investigations)

Reporting for the period from February 25th to April 15th he writes: "During the early part of this period the work of determining the percentage of kernel, shell, and hull in the fruits from selected tung trees was completed. On the basis of these data and descriptions of the trees made last fall, 20 of the most promising were selected for vegetative propagation. Budwood was secured from each of these, from 9 selections made at the Cairo, Ga. laboratory and 12 made in the Gainesville, Fla. area. This has been worked on 3,749 1-year-old seedlings. Since the primary objective is to secure propagation wood from which a liberal supply of trees can be budded for test as varieties, comparatively little experimentation on budding methods has been done. Previous experience having indicated that patchbudding is rather more reliable than T-budding, it has been exclusively used. Some trials were made of different methods of removing the patch from the budsticks and, where budwood was scarce, of the suitability of dormant buds from 2-year wood.

"Individual plantings of nuts from each of the 300 odd selected trees have been made in two nurseries, one in Louisiana and one on the Mississippi Cooperative Tung Farm. Not only were the nuts of each tree kept separate but these lots were in many cases subdivided for tests of different methods of planting. The preparation, planting and recording of more than 1,000 lots has involved an enormous amount of detail. The tung farm nursery is about 13 acres in extent, and the one in Louisiana 7 or 8. Still other tests involving several seed treatments are being tried with nuts of two trees, of which a considerable supply was available. Another major operation has been the selection of areas for field plot work with nutrients.....

"The frost injury of February 23-24 afforded an opportunity for research as advantageous to our tung organization as it was disastrous to commercial interests. In general young trees under conditions of good air drainage in Washington and St. Tammany parishes of Louisiana and in the Pearl River county, Mississippi, will bear a good crop. Bearing trees suffered more severely. However, in all areas there are individual trees and sometimes individual branches that resisted the low temperature...At first we were much excited when we found a resistant tree and even went so far as to bud from two or three of them. Now we know there are a great many and we plan to devote considerable study to selection of those not only frost resistant but also desirable in other respects.

"During the period covered by this report the orchards have blossomed and Dr. McCann has completed collections for the blossom bud development study and initiated his second project on development of the fruit. This has involved controlled pollinations and collections at regular intervals for study of pollen tube growth, fertilization and development of the fruit...Preliminary microscopic studies of fresh material indicate that injury to the flower buds is generally, if not always, accompanied by a killing of the protoxylem strands at the tip of the twig."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Geo. P. Hoffmann (Vegetable crop investigations)

"None less than a 'baby cyclone' accompanied by a cloudburst of rain was had Wednesday night and Thursday morning," he writes for the week ending April 8th. "Wind was uncomfortably and dangerously heavy and resulted generally in some slight damage in this section. Station property damage included part of the roof being blown from the steel top machinery shed, a screen torn from the field laboratory, awnings badly torn on the main building, six hotbed sash completely demolished and an equal number more or less slightly damaged, a water tank (temporarily stored in the service yard) completely wrecked, and forest and lawn trees here and there blown down. The fact that we were in a path of what might have been serious damage and loss is well illustrated in my stating that the wrecked tank partly tore down and was blown over a well constructed fence and was found a half mile east of the station; the hotbed sash was blown from over the tomato beds to a distance of 30 to 50 feet and broken to kindling wood. Our tomato plants in the wrecked beds were to some extent damaged but a sufficient surplus of all varieties is had for planting. Temperatures for the week were 53° to 80° F., maximums, and 32° to 63°, minimums, with a light frost on the morning of April 8. Precipitation for the week was 0.79 inch....Painting of the station road signs on the U. S. Routes 30 and 45 and the sign over the entrance gate to the station was in part finished during the week.

"The previously reported bedded sweetpotato seedlings are sprouting and it is interesting to note how much faster some selections begin than others. This is going to be a very interesting and worthwhile study."

N. H. Loomis (Small fruit investigations)

"The first strawberries were harvested the week ending April 8, but due to continued cool, wet weather the quality has been poor and the strawberries have ripened very slowly. Leaf diseases are showing up more every day and may injure the crop of some varieties considerably. A light frost Friday night killed a few open strawberry blossoms but did not injure fruit already set. There was no injury on the grapes. The strawberries shipped from the Marion section have been poorly colored and extremely acid even for Klondikes."

J. M. Lutz (Handling, transportation, storage and utilization)

"Reports from Hammond, La. indicate that strawberry shipments are getting into full swing," he writes April 8th. "The largest daily shipment thus far was on April 3, when 111 cars moved. Although total shipments are still 600 cars behind those of last season, there are indications that the total shipments for the season will surpass the 2,442 cars shipped last year."

ADMINISTRATIVE NOTES

Bids We have just been advised by the Division of Purchase, Sales and Traffic that no bids will be opened in Washington, D. C. after June 10, 1939; and no acceptances made on either bids opened in Washington, D. C. or in the field after June 17, 1939.

This means that any bids will have to be received in our Business Office a sufficient time in advance of the above relative dates to allow for handling in case volume of orders, etc. is--as is quite likely to be the case--such as to cause some delay in handling.

Manuscripts Possibly it is just the Scotch in us, or maybe we think that because material is sent under frank we should be careful to keep the weight down--well, anyway, the Office of Information is complaining about manuscripts that come in typed on very thin paper.

"At this time this office receives manuscripts for publication typed on very thin paper," writes Dr. Merrill to Bureau editors. "Such manuscripts are exceedingly difficult to read and to edit. To avoid these difficulties, will you kindly ask your units that prepare manuscripts for publication to use a good bond paper, or at least paper that has the desired weight and quality, if the material is intended for printing at the Government Printing Office. Otherwise we may find it necessary to return the copy for typing on suitable paper."

The average correspondence bond paper is all right--what is called 20-lb. From the standpoint of economy, too, it might be well to avoid the practice of some of our writers who merely use letter-heads for the manuscripts. Letter heads are printed for a particular use and merely turning them over to obtain a completely blank page is dodging the issue--and not very successfully.

Reprints While on the subject of manuscripts: Now and then we get letters from our workers and others asking for reprints of articles by members of our staff, articles printed in outside journals. These journals do not supply the Division with reprints. Since papers for outside publication are usually furnished without charge to the journals concerned, we have suggested from time to time that the publishers should be requested to supply you free with such reprints as you need. We still think this is a good trick, even if you can't do it. But at least do not refer applications to the Business Office--take a chance on the author.

Vol. 11 No. 9

May 1, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

SEMI - MONTHLY NEWS LETTER

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI.

Washington, D. C., May 15, 1939

No.10

The Lychee "Two and one-third acres of lychees (Litchi sinensis) have been set out at the new U. S. Subtropical Fruit Research Station near Orlando, Fla., and are doing nicely," writes Dr. Hamilton P. Traub, in charge of our section of Citrus, Avocado, and Other Tropical Fruit Investigations. "This planting will serve for preliminary nutrition and pruning studies. On the laboratory grounds in Orlando, two trees of the Sweet Cliff, one of the finest Chinese lychee varieties, have bloomed this season and have set a good crop of fruit. This is the first time that this variety has fruited in this country.

"During the past blooming season the flowering habit of the lychee, on the basis of the Sweet Cliff variety, was studied. The compound inflorescences first produced staminate flowers for several days and this is followed by a period of pistillate flower production, and a final period when staminate flowers appear. In a few cases pistillate flowers were produced a second time after the last staminate flowers, but this was most likely exceptional. These observations are in essential agreement with the results reported by Rahman Kahn in India (1929).

"Trees of the Brewster Lychee variety have been fruiting in Florida for 10 years or more, notably in Manatee, Highlands, Lee, Dade, Polk, and orange counties."

The lychee, of course, is a famous fruit of south China, over which Chinese poets and writers have enthused for centuries. In western countries it is known chiefly in its dried form as the "lychee nut," resembling a raisin in a thin shell, but with a flavor all its own. It is rather astonishing that a fruit of such high quality should not have been considered commercially in this country until quite recent years, even though the sections in which it may be grown successfully are limited.

SUBTROPICAL FRUIT INVESTIGATIONS

T. Ralph Robinson, Orlando, Fla.

"With the close of the avocado blooming season a recent check up has been made of the set of fruit from cross pollinations made by hand," he writes April 28th. "The method described as successful last season has again been followed, viz: enclosing bloom clusters before flowers start to open with ordinary mosquito netting to exclude visiting insects. As flowers start to open these net bags are opened each day at the proper hour and pollen-bearing flowers of the selected male parent are used directly on the receptive stigmas of the female parent. This is repeated daily until all the buds have opened, usually a period of three to four weeks.

"The flowers of practically all important avocado varieties in Florida are definitely synchronized so that the 'proper hour' for pollination work may be scheduled with slight expectation of change. For instance, between 10 and 11 a.m. one may find on Taylor and Lula trees (Class A) freshly opened receptive flowers but no pollen flowers; at this same hour Nabal and Winslowson (Class B) will furnish an abundance of freshly opened pollen flowers but show no receptive flowers. These pollen flowers on Nabal and other Class B varieties had their first opening on the preceding afternoon, closing at night without anthers dehiscing, evidently a provision of Nature to provide against self pollination. This provision also obviates the need for laborious and injurious emasculation of the flowers being pollinated, since the stigma is receptive long before any pollen is shed.

"Again in the afternoon, between 3 and 4 o'clock pollen flowers are available from Taylor and Lula to pollinate such varieties as Nabal. This season these varieties have been chiefly used in reciprocal crosses. All these varieties have proved relatively hardy and productive, but have certain faults that might be corrected if hybrids between them could be secured. For instance, Lula is highly susceptible to scab while Taylor is resistant, and somewhat later in maturity. Nabal is still later in maturity and has a more desirable shaped fruit than Lula or Taylor, with a very small seed.

"Two weeks after removal of the netbags a total of 130 fruits set from these hand pollinations have been noted. However, with usual heavy droppage during May and June the breeder may feel fortunate to have 10 to 20 fruits for harvesting next winter. With the avocado producing fully a thousand flowers to each one that is destined to bear fruit, the law of chance runs heavily against the breeder's success, but even so, it is well worth trying. In the recent planting of avocados at the new U.S. Subtropical Fruit Research Station near Orlando, Fla. are included a number of stocks on which two varieties have been grafted with a view to securing hybrids on a larger scale. By tenting these at blooming time and providing bees as pollinating agents, many cross pollinations should be reasonably certain because of the proterogynous character of the avocado bloom."

HANDLING, TRANSPORTATION AND STORAGE, AND MARKET DISEASE INVESTIGATIONS.

C. O. Bratley, New York, N. Y.

Writing from the New York City market pathological laboratory on April 28th he says: "Judging by the New York City market response the South Florida growers of Red Bliss new potatoes have just finished a much more profitable season than last year. Shipments last year were in good condition except for two weeks early in the season, but the supply was large and the prices received in many cases barely covered freight charges. When in Florida in January of this year I learned that the acreage planted had been considerably reduced from that of last season and the harvest would be reduced still further by extended drought. Many of the growers failing to make expenses on last year's crop had gone deeper into debt for fertilizer, seed and labor.

"At the beginning of the present season one of the heavy shippers installed a very expensive hot-air dryer for the washed tubers. We have watched the condition of potatoes from this packing house with particular interest, but in none of them did we find any decay. In early February several shipments made by four other shippers who as far as we can learn pack and ship their potatoes without drying them, showed from 1 to 15 percent slimy soft rot (*Bacillus* spp.) on arrival in New York City. Upon referring to the weather records for South Florida, it was found that most of these shipments were made during warm cloudy periods accompanied by occasional showers.

"Except for these rare instances the shipments were surprisingly free from decay, making the season as a whole one of the best in this respect since the deal began some eight years ago. Undoubtedly the generally clear weather and lack of rain throughout the season were responsible in large measure for freedom from decay. During January, February and March, South Florida had between 50 and 60 percent of its normal rainfall. The only complaints heard on conditions of the potatoes were heavy 'skinning' early shipments and the lack of deep red color usually associated with the variety. Selling price here was maintained well except for about two weeks in early March, the height of the season. Receivers estimate that an average of \$1.25 was returned to shippers, giving them a profit of almost \$.25 per bushel."

NUT INVESTIGATIONS

Felix S. Lagasse and Harold M. Sell, Gainesville, Fla. (Tung investigations)

"There is a scattering of fruit in some orchards, but no commercial crop," they report April 27th. "The development of a hardy variety of high oil content, and a successful method of vegetative propagation stand out as the most important needs of the industry at the present time."

NUT INVESTIGATIONS

George F. Potter, Bogalusa, La. (Tung investigations)

"In company with Dr. Drosdoff of the Division of Soil Survey, the writer has continued to study the soil types on which the tung orchards of this area are growing," he writes for the week ending April 29th. "On Friday and Saturday we were accompanied also by Mr. Earl D. Fowler, district soil survey inspector for this territory. A wide variety of soils are being planted. In many of them a compact layer is found, sometimes within 24" of the surface, sometimes as deep as 40". In some cases the layer is crumbly in character, once it has been penetrated. In other cases it is heavy and plastic. It appears certain that while young tung trees thrive almost universally, there will be a vast difference in the ability of the different soils to support the mature orchards producing heavy crops.

"On Thursday Dr. Angelo, Dr. Drosdoff and the writer visited a number of the principal tung orchards in Stone County, Mississippi. Here the orchards were found in some cases planted on deep fertile soils of river terraces where growth will undoubtedly be excellent, but because of the topography the frost hazard is considerable. Others were planted on sites more similar to those commonly used in Pearl River County, Miss. and in Washington, St. Tammany and Tangipahoa Parishes, La. Here on the ridge tops the soil tends to be thinner and the compact layer closer to the surface, but the situation as regards air drainage is much improved... We are now prepared to begin actual selection of plots in which the adaptability of different soils types will be compared."

He had written April 22d: "Dr. Angelo and Mr. Hankins have attended to unwrapping those buds on the tung trees that were set three weeks or more ago. Out of the 2,000 which have been unwrapped they find a very excellent 'take,' estimated at 98 percent. However, with this tree the principal difficulty of budding, according to the testimony of nurserymen from Georgia to Louisiana, is to get the buds to force out well. We know that owing to lack of suitable budwood a large number of very weak buds were put on these trees and we have our fingers crossed despite the very fine take."

John R. Cole, Albany, Ga.

"We applied our prepollination spray application of 2-1/2-50 bordeaux mixture at Fort Valley on Wednesday," he writes from the U. S. Pecan Disease Field Laboratory on April 22.

"The weather was unfavorable, cold and windy, however no injury was caused to the bloom or foliage. Between 50 and 60 pecan growers, representing 10 counties, were present to observe our spraying."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

"Rather extensive observations were made in the stage of development of staminate and pistillate flowers on the different varieties," he writes from the U. S. Pecan Field Station and Laboratory on April 22d.

"Moore and Alley catkins are shedding pollen and the Moneymaker pistillate flowers are closely approaching the receptive condition. A considerable variation is noted this year in the stage of development of the flowers on different trees and in different orchards. Some Schley trees are quite advanced in development but generally will not be shedding pollen or receptive for another 10 days. Moore pistillate flowers are comparable to Schley in state of development. As usual the Stuart flowers are much less advanced. Some bagging of clusters for use in making controlled crosses has been done. Bagging clusters for use in the drop studies will probably be started about the middle of next week.

"From the observations made during the week it is estimated that the bloom this year will be as heavy and possibly heavier than last year. We will have a heavy bloom at Philema, especially on the seedling trees and the young trees in the Brown orchard."

F. N. Dodge, Shreveport, La.

"Twenty-seven varieties are now showing pistillate blossoms, and Nelson is shedding pollen," he writes April 22d concerning trees at the Robson pecan field station. "Pistillate bloom on Mahan is very light this year, while it is heavy on the Moore trees. It looks like the Moore trees will make heavier yields of nuts this year than the Mahan trees.

"Six varieties show practically no pistillate or staminate bloom on the unsprayed trees, while bordeaux sprayed trees show a heavy bloom of both. Several other varieties show observable blossom differences in favor of the bordeaux sprayed trees."

C. L. Smith, Brownwood, Tex.

Writing from the pecan field station for the week of April 17-22, he reports: "Samples and yields of cover crops were taken at Leonard's grove at Wharton. The yellow flowering sweet clover and Hubam clover made excellent growth, yielding from 10 to 13 tons green matter per acre. Hairy vetch was again poor on most plats. From results thus far it appears that hairy vetch is far inferior to yellow flowering sweet clover or Hubam. The yellow flowering sweet clover is three or four weeks earlier than either of the other two and this is a distinct advantage where it is necessary to turn the crop early in spring. The yield of this clover and Hubam has been consistently high on all plats for two years in succession. The weather conditions at Wharton have been unusually dry this spring. About half an inch of rain fell there about April 15th."

NUT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg.

"Unseasonably warm dry weather continues to prevail in Oregon," he writes April 22d. "The weather bureau states that at Portland only .22 of an inch of rain has fallen in the last 36 days. This is the longest dry period at this time of year since records have been kept at Portland. Unless rain falls shortly farmers stand to lose heavily on their 1939 crops. The drought is now injuring spring seeding of grass and clover and pasture growth is slowing up. Berries have not been materially hurt as yet though many growers have lost considerable moisture from the soil by failure to cultivate and the crops may suffer seriously unless rain arrives shortly. Truck gardens are already suffering from the lack of moisture."

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunegan, Fayetteville, Ark.

"I visited the Clarksville peach section on April 24th at the request of Mr. C. C. Lockwood, the county agent, to ascertain the cause of the peach trees dying in the section. I found that the trees in this area are suffering from winter injury in much the same fashion as the trees in the Nashville area. One orchard was losing between 400 and 500 Elberta trees 9 years old. This represents the most serious case in the district, but affected trees were observed in all the orchards examined.

"An examination of the apple spray experiment plots on April 26th showed a further development of the scab fungus on the leaves. The young apples are beginning to develop and it is evident now that the frost of April 6th did not reduce the crop to a point where there would not be sufficient fruit for a spray experiment."

H. F. Bergman, East Wareham, Mass.

"There is a considerable amount of winter flooding injury evident this spring," he writes May 3d. "A number of growers have reported leaf drop. I looked at one bog of about 6 acres on which the injury was quite severe. On this bog the Howes vines were in much worse condition than the Early Black. Among the Howes large patches appeared dead, the leaves had all fallen and most of the terminal buds were killed. The injury will reduce the crop by at least 50 percent on this bog....Symptoms of spring dwarf are now very evident on strawberries around Falmouth and Wahquoit. The nematodes are working actively and were found in large numbers in all stages from the egg to the adult. One small planting of the variety Catskill was very badly infested, apparently worse even than the Howard. Nearly all the new plants ordered this year came from Michigan nurseries. Leaf spot (*Mycosphaerella*) was very abundant in a field near Wahquoit but this grower intends to spray this year to control the disease. Only a little leaf spot was found elsewhere."

DECIDUOUS FRUIT INVESTIGATIONS

John H. Weinberger, Fort Valley, Ga.

"The crop reporting service of the Department of Agriculture estimated on April 10th a 65 percent condition in the peach crop of Georgia for 1939 as compared with a 70 percent condition for last year," he writes April 17th. "Mr. Bewley of the Georgia Peach Growers Exchange in a newspaper statement reports from his own survey of orchards throughout the State that the peach yield will not exceed 6,000 cars as compared with more than 11,000 cars for last year.

"In a personal survey of crop conditions at the laboratory last week, I find that practically all seedling trees from the 1936 Beltsville crosses have a crop of fruit. Many of them require thinning. It was encouraging to note that about 10 or 12 of the trees have peaches that are larger than Hiley at the present time. All trees in the variety block except the Florida varieties have some fruit also, and the old Shalil block will have a light crop.

"Now that danger of frost is past, growers in this section are cultivating their orchards for the first time this season. Mr. Baird, for example, thinned his fruit two weeks ago and is starting cultivation today. Late cultivation and failure to apply a quickly available nitrogen fertilizer before bloom may be responsible for the light set of fruit in some Elberta orchards around Fort Valley this year. It does not seem probable that frost alone is responsible."

He had written Dr. Cullinan on April 11th: "The peach orchards in northeast Georgia, mostly Elberta, appear to have a fair set of fruit, and it is perhaps the only section of the State where the Elberta prospects are uniformly good. In the central section of the State the summary of reports and quotations, not verified, is 25 to 30 percent of an Elberta crop. Mr. Dickey, of Musella, Ga., who usually ships 75 cars of Elbertas, is said to have stated that his wife could can his entire Elberta crop this year. Since a large part of the Georgia crop is Elberta, the total crop for the State may not be as large as last year, though there appears to be a better than average crop of Hiley and early varieties. Nearly all of the crop reduction occurred on February 23d when the temperature at the laboratory dropped to 22°F. Since then there have been a few light frosts, with scattered injury."

C. O. Hesse, Davis, Calif.

"Continued warm weather indicates an early season this year in spite of the relatively late bloom this spring," he writes April 15th. "We can expect apricots to start moving in quantities around the 25th of May from the Winters section. Apricots have set a heavy crop this year, but not as heavy as in 1937. The set is well distributed on the trees, so that the thinning operations, which are well along at this time, are not as expensive to the growers as might be expected."

DECIDUOUS FRUIT INVESTIGATIONS

C. P. Harley, Wenatchee, Wash.

"Weather conditions for the Wenatchee Valley this spring up to the present time have been normal in every respect except for rainfall," he writes April 21st. "The last precipitation which we had was a light snowfall in early March. Since that time we have not had a single drop of rain. In spite of this drought, however, the soil still shows a good moisture content and irrigation has not been started in most orchards any sooner this year than in past years. All indications point at the present to full bloom in apples on the 24th. The last few days have been very warm with maximum temperatures between 76° and 80° F., and the blossoms have pushed out very rapidly. Weather conditions were excellent for cherry pollination and for pears as well...."

"The Fewkes Golden Delicious and Delicious orchard is 100 percent blank this year as far as blossoms are concerned. There are two or three exceptions, however, and these are the ones which I thinned last spring. One tree in particular that was thinned to a ratio of 30 leaves per apple came back with a very fine bloom. This tree was thinned 17 days from full bloom. Other trees thinned later or with less leaves per apple show very few fruit buds formed--not enough for a crop. Last year these trees were very vigorous and this suggests that the correction of biennial bearing in Golden Delicious by fruit thinning here in the Northwest is quite a serious problem. I do not know what the results will be at the Capt. Terry Ranch where a large number of Golden Delicious trees were thinned early last year as far as actual percentage of blossom buds formed. However, I do know that Capt. Terry will have a crop, whereas his neighbor, who employed the same thinning crew after the thinning was completed at the Terry ranch, will have an orchard which is practically 100 percent blank."

Elmer Snyder, Fresno, Calif.

"Many grape shoots are now 3 feet or more in length," he reports April 22d. "Some of the grape rootstocks are blossoming and many of the vinifera varieties are fast approaching the bloom stage. Grape breeding plans have been outlined and clusters have been sacked to obtain pollen for the various crosses. While most of the 1938 crosses were made during May 20 to June 1st, this season the breeding work will be at least a week earlier."

"Grape seedlings growing in the greenhouse have made sufficient growth so that green buds can be obtained to 'T' bud into the shoots of rootstocks growing in the field. Several thousand buds will be inserted during the next two week period."

"Seeding buds of the 1937 crosses inserted in rootstocks last year are now showing fruit clusters."

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Wilcox, Pemberton, N. J.

"Vegetation has been growing rapidly and green leaves are appearing on many trees," he writes April 29th. "The wetness of the soil is still retarding growth, however, and agricultural work is far behind schedule. For example, the first commercial cutting of New Jersey asparagus appeared on the market this morning, at least two weeks behind normal. We had more than two inches of rain during the week, most of it on the 26th, though there was also some precipitation on the 23d, 27th and 28th.

"Blueberries of all varieties have started into growth but have not begun to bloom. Sclerotina 'mummies' which were at the surface of the ground have discharged most of their spores. In most fields, however, a good many mummies have been buried by cultivation after the fruiting season last summer, and the time of appearance of the apothecia depends on the depth at which they wintered. Some of these mummies have not yet matured any spores. Two growers have gone to the expense of digging up these mummies as soon as the apothecia have appeared above the surface. In those fields where no cultivation was done after the picking season, one thorough sweeping disposed of practically all the mummies. There was one period of possible infection from the 26th to the 28th. No signs of primary infection or 'blight' have yet appeared."

E. S. Degman, Medford, Oreg.

"Our bloom was about two weeks ahead of last year but hot weather during the following bloom has caused other spring phenomena to be more advanced," he reports April 27th. "In 1938 our first codling moth was caught May 10, in 1939 on April 11, with the peak catch in 1938 on May 22 and in 1939 on April 27 (I hope) as we caught 97 per pan last night. While the initial set of Anjou pear trees appears to be better than last year, it is too early yet to make an accurate estimate. The general conception seems to be that the Anjou, Bartlett and Winter Nelis crops will be a little better than last year, Comice about the same, and Bosc lighter, with approximately the same tonnage for the valley crop."

M. A. Smith, Columbia, Mo.

"We have had five consecutive days of clear weather during which time most apple varieties in southern and central Missouri have come into full bloom," he writes from the Fruit Disease Laboratory on April 26th. "Conditions for pollination have been excellent. Most apple varieties are carrying a very heavy bloom.

"Primary apple scab infection was observed on the variety McIntosh last week. Taphrina deformans was observed in the peach varietal plots at Mountain Grove. Gymnosporangium juniperi-virgihianae was observed on cedars last week."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Geo. P. Hoffman (Vegetable Crop Investigations)

"Weather for the week ending April 15th was 63-78°F., maximum temperatures, and 40-61° minimum, with rain during the early part of the week and light shower Saturday. The wind is the worst that we have ever before experienced for this season of the year.

"The sweetpotatoes are rapidly developing sprouts in the plant beds and it is interesting to note how much slower some varieties and selections are than others.

"Reports from the Crystal Springs section indicate that good yields and satisfactory prices (\$50.00 per ton) are being had for cabbage. Peas are not so good, and tomatoes are slow in growth because of low temperature."

J. M. Lutz (Handling, Transportation, Storage and Utilization Investg.)

"There is a slightly increased usage of display crates in the Hammond, La. section this year. At the auction on April 13th about 20 percent of the cars were of this type. They generally brought a premium of about \$15 to \$35 a car. Buyers seem to prefer this type of crate because it results in less cutting and bruising than is the case with the old style crate with cleated divider. Carrying quality is reported as having been good thus far this year. Cool weather has undoubtedly contributed in this."

N. H. Loomis (Small Fruit Investigations)

"During the past week an inspection trip was made to Baton Rouge and the strawberry section around Hammond and Ponchatoula, La. Dr. Miller at Louisiana State University has one new strawberry variety known as Bk.6-30 which is very outstanding in those sections. The berry is very firm, of good dessert quality, and considerably earlier than Klondike, the standard commercial berry. This new variety is extremely vigorous, productive, an abundant plant producer, and is highly resistant to leaf diseases even where the plantings were sprayed with spore suspensions of the diseases. In a trial made at Meridian, it has been just as outstanding as at Baton Rouge and Hammond.

"At Hammond, a few northern varieties of blueberries were observed all of which were subject to delayed dormancy troubles. Rancocas seemed to be better adapted than June, Cabot, Pioneer and Concord.

"At the Meridian station severe winds and rain have torn the first two or three leaves of many grape varieties all to pieces. Breakage of new growth was very slight considering the amount of wind."

SUMMER ACCIDENT HAZARDS

A memorandum from the Office of the Director of Personnel, dated May 3, 1939, invites attention to the fact that the Department's accident graphs for 1938 show a sharp rise in accident frequency during June, continuing upward to a peak in August and then a sharp drop in September.

The accidents causing the peak were not all due to heat exhaustion, prostration and cramps, but working in high temperatures makes employees more susceptible to ordinary accident hazards so that accidents of all kinds increase during the hot summer months.

This is not a new condition by any means, the memorandum points out. The accident record of a number of private industries formerly followed similar trends until steps were taken to minimize hot weather hazards. The methods and materials used for this purpose by industry are available to all bureaus and offices of the Department of Agriculture. It is not necessary for us to experiment. Each locality in which projects are in operation will present individual problems, particularly in regard to sanitation and health. These can be dealt with as they arise, but it is necessary to begin at once to plan for the minimizing if not the elimination of the general problems confronting practically all projects by:

- "1. Taking the physically weak and unfit from the crews doing arduous and hazardous work; such persons should be assigned to light work if such is available.
- "2. Arranging the work so that the men gradually become accustomed to working in high temperatures. Particularly new employees and others who are not accustomed to such conditions should not be rushed into regular tasks in high temperatures, or in the direct rays of the sun, without a period of gradual seasoning.
- "3. An adequate supply of pure drinking water from a known sanitary source is necessary. It is not only necessary that the water be pure to begin with, but also that it is transported and handled in sanitary vessels and served in a sanitary manner."

In this connection, it should be pointed out that Department of Agriculture Regulations, Paragraph 1735, reads: "The use of public drinking cups is prohibited. They will be confiscated wherever found. Individual sanitary cups should be used."

SUMMER ACCIDENT HAZARDS (continued)

"There is a portable sanitary drinking fountain on the General Schedule of Supplies that is recommended for use instead of the individual cups. It will save its cost in a short time in the saving in purchase of cups and is much better, more sanitary and economical where crews are taught how to use it properly.

- "4. The cause of heat exhaustion, prostration and cramps has been found to be the lowering of the salt content of the body through normal body functions and perspiration. The restoration of salt to the system through the use of salt tablets which can be made available to all workers will be found to eliminate accidents and sickness from these causes. A salt tablet dispenser has been placed on the General Schedule of Supplies, attached to the portable sanitary drinking fountain. By the use of these devices both problems can be solved in the most efficient manner.
- "5. The treatment of severe burns has always been a serious problem in summer work of a number of Bureaus and Services. A first aid kit has recently been made available which carries materials for the spray application of the tannic acid burn treatment. This treatment has been found by industrial physicians to be much more effective in the treatment of large area burns than the oils and greases formerly used.
- "6. Drowning, sunburn, poison ivy, poison sumac, snake bites, etc., all produce many accidents. Drowning caused 6 deaths of departmental workers during 1938. A life saving course given by the American Red Cross or the Bureau of Mines might be the means of saving a fellow worker or a friend this coming summer. For information about these courses contact the Bureau of Mines or the American Red Cross."

The Safety Section of the Office of the Department's Director of Personnel is ready to assist any organization or station in solving the summer accident problem and solicits questions of any kind in regard to such accidents. If you have any difficulties of this sort that are bothering you, send in your questions to our Business Office which will pass them along promptly to the Office of the Director of Personnel if the desired information is not already available here.

INSPECTION OF PLANT MATERIAL

Mimeographed instructions relative to the inspection of plant material were recently mailed to members of the field force, as a source of information and guidance for the new employees and to refresh the memories of others. Since then, however, the Business Office has received inquiries that make it appear that there are some of our workers who are under the impression that the inspection procedure is something new. This is no doubt due to the fact that the instructions have not been referred to for some time--and possibly have not, in rare cases, been closely observed.

There is no thought of discouraging the securing or exchanging of foreign plant material, but instead to facilitate such transactions by making certain that the prescribed procedure is strictly adhered to at all times.

While the Division of Plant Exploration and Introduction of the Bureau of Plant Industry acts as agent in ordering, receiving and handling all plant material either from abroad or destined for foreign correspondents of the Bureau, it is essential that all requests for purchase as well as detailed information and correspondence relative to the ultimate securing or exchanging of foreign plant material be forwarded to our Business Office for transmission to the Division of Plant Exploration and Introduction.

In view of the dangers arising from bringing into this country cultures of pathogenic organisms, all requests to foreign countries for fungus cultures must first be transmitted to the Business Office so that the approval of the Chief of Bureau may be obtained before the request goes out.

To facilitate the work of the Division of Plant Introduction, all shipments, both foreign and domestic, should be accompanied by full information on the instruction card as well as a shipping tag addressed to the consignee.

The Business Office will be glad to furnish instructions and shipping-instruction cards upon request.

ADMINISTRATIVE NOTE

Fire! Recently a calculating machine caused a fire in the Department building at Washington, D. C. Prompt action prevented serious damage. It was assumed at first, of course, that the fire was caused by the rapid manipulation of the calculator in the attempt to stretch out the budget to June 30th. This assumption proved to be incorrect. The fire was caused by cleaning the machine with benzol. As a result of the investigation of the cause, the Office of Plant and Operations of the Department has forbidden the use of either, gasoline, benzol (benzene) or any high volatile liquid for cleaning purposes. As a further precaution, machines should be disconnected from the electric line before being cleaned. Heads of field stations, please note!

Vol. 11 No. 10

May 15, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

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Vol. XI

Washington, D.C., June 1, 1939

No. 11

J. M. Lutz of our section of handling, transportation, storage, and market disease investigations, stationed at the U. S. Horticultural Field Station, Meridian, Miss., writes Mr. Fisher a very interesting letter concerning observations during a recent visit to Louisiana.

"I took the opportunity to visit some of the Irish potato sections of Louisiana last week," he writes. "I spent the better part of a day with Dr. Stuart at Cut Off. They were washing potatoes there but not precooling. They were having some trouble with carrying quality on some cars and were considering trying to precool to overcome this difficulty. Washing seems to be a more or less common practice in Louisiana with large growers who want to harvest every day regardless of whether the ground is wet or dry. A heavy rain had fallen just before I visited some of the sections. Some of the potatoes looked like balls of mud before they were washed. Small growers generally harvest only when it is dry and their potatoes are generally not washed nor precooled," continues the report, dated May 17th.

"Godchaux's at Reserve are washing and precooling with fans using two tons of ice per car. Mr. Toups, their manager, advises that this is the fourth season which they have precooled and they have not had any trouble. He says that larger amounts of ice do not seem to help.

"At New Roads, Louisiana, the season was just getting under way. They were washing there and precooling with Ralph Killinstad's mechanical precooling apparatus which is mounted on a truck. Two of these units were working in this section. They generally operate about 2 hours and take out 20 to 50 gallons of water per car (240 to 250 - 100S sacks).

HANDLING, TRANSPORTATION AND STORAGE AND MARKET DISEASE INVESTIGATIONS.

J. M. Lutz (continued)

"At Zachary, La. the shipper obtained his potatoes mostly from small growers and was not washing nor precooling when I was there. He reports having had trouble with only one car this season. He says that he sometimes washes potatoes and may do so later this year--when he does wash, he says he will precool.

"At Cut Off, La, they were blowing some of the water off with a fan just as the potatoes left the washers. They haul their potatoes about 15 miles by motor truck to the loading point. Usually 2 or 3 hours elapse between washing and loading. I noticed some sacks of potatoes in the packing shed which had been washed about 3 hours earlier. They seemed fairly dry except in the center of the sack where the potatoes were still damp. They were using Iron Age kid glove diggers at Cut Off and it was handling the potatoes in fine shape. The percentage of potatoes which were skinned was relatively small. The potatoes were pretty well advanced in maturity so that this might have been a contributing factor. The wooden conveyers were covered with mud so this might also have been a contributing factor. They ought not to have any trouble with heat injury because they arrange the work so that the potatoes are picked up almost before they fall off the digger. Some points that I visited, where the potatoes were dug with plows, there was almost 100 percent skinning by the time the potatoes reached the packing house. By the time the potatoes were washed and graded many of the tubers had half of their skin removed.

"Methods of handling potatoes in some places were pretty rough. A drop of 6 or 8 inches in many places on the graders or washers was not uncommon, and of course in filling the sacks there is also an appreciable drop. I heard some one describe the methods of handling tomatoes at Crystal Springs by saying that he wouldn't want the hard coal that he burns in his furnace handled the way they frequently handle tomatoes. I think the same would hold true with regard to some of the methods of handling potatoes."

"General Foods is freezing quite a few sliced strawberries in 10-lb. containers at Ponchatoula, La. this year. They were using the fruit from four grading tables when I was there. It was taking them 4 hours to freeze this size package. One of the cold storages at Hammond has leased a Z freezer. The berries were frozen individually in an invert sugar sirup solution at 10° to 15° F. in about 15 minutes. They were packed in 9-pound cartons for the bakery trade."

Writing of his work at Meridian he says that the potato patch there has made good growth. "Even the cold storage plant, which has given considerable trouble this spring, is working in fine shape now!" he adds.

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Geo. P. Hoffman (Vegetable crop investigations)

"Sweetpotato plants of the Mameyita variety were supplied in approximately 50-plant lots to 30 growers interested in getting seed stock of this variety," he writes May 6th. "For some reason yet to be definitely known, this variety seems to be attracting attention and is in demand."

"Observations made on two lots of sweetpotato seedling 'tubers' (roots) bedded at the same time--Beltsville, Md. lot 'B' and Baton Rouge, La., lot 'L'--revealed that the former or 'B' lot is much farther advanced in sprouting and plant production than is the latter or 'L' lot. Plants are now (April 29th) ready to go to the field."

J. M. Lutz (Handing, transportation and storage investigations)

"One of the most significant changes taking place in the transportation of horticultural products in the South is the trend toward movement by motor truck. It has been estimated that about one-third of the cabbage shipped from Mississippi thus far this year has been by motor truck. At a service station recently we noticed a truck loaded with ten tons of cabbage which was bound for Kalamazoo, Mich. A considerable portion of the strawberry crop from Marion, Miss. is moving by motor truck. A non-refrigerated truck loaded with strawberries left Marion for St. Louis at 2 p.m. and arrived there at 5 a.m. the following morning. The fruit was reported to have arrived in good condition. About 50 percent of the asparagus movement from South Carolina is reported as having been shipped by motor truck. One important section where the truck has not made inroads is the Louisiana strawberry section where the entire crop (except that for nearby markets) moves by refrigerated express."

N. H. Loomis (Small fruit investigations)

"Strawberry harvests and grape breeding work required practically the entire week ending May 6th. Some strawberry selections among those under trial appear very promising as commercial berries for they not only yield well, are firm, and have good color, but the plants are also fairly resistant to leaf diseases. The Klondike, which is the standard commercial berry in this section, has been just about the poorest producer of all the varieties under trial. This year has been especially favorable to the spread of strawberry leaf diseases and Klondike yields have been cut by this factor. Although the growers have obtained exceptionally high prices, they realize that they have soon got to change variety or spray. Consequently, more interest has been shown in the strawberry work of this station than in any previous year....Growth records were taken in the grape experiment on the effect of time of pruning on foliation. The records have been summarized and there is no difference between the blocks pruned January 1 and those pruned February 1, but those pruned March 1 are definitely retarded in foliating. The differences have not been tested statistically but are quite probably significant."

NUT INVESTIGATIONS

Milo N. Wood, Sacramento, Calif.

"The almond yield in the Sacramento Valley will be quite good from present appearances," he writes May 6th. "Some of the irrigated orchards will be able to produce heavy crops. The Peerless variety will probably run considerably lower in yield than last year. In quite a number of cases the Peerless was damaged by the frost. This confirms conclusions made in past years; namely, that the Peerless variety may bloom at practically the same time the Nonpareil does and yet will be damaged by frost while the Nonpareil will go through with a good crop. Non-irrigated almond orchards will no doubt suffer for lack of water as this has been one of the driest seasons we have had for years. Some of the small orchards in Lake County have good crops as is also the case in the trees noticed in the Napa Valley, with the exception that the yield is very spotted, some orchards having very light crops. It seems probable that the almond crop for the northern part of the State will be much better than previously reported. This is due to the fact that the frost injury was not as general as expected. Furthermore, quite an acreage has been heated during frost nights..."

He had written April 29th: "Attention has been given to the almond orchard trouble we have called 'the peculiar trouble.' In this trouble the buds drop from the branches prematurely, leaving long bare spots while at the ends of the twigs numerous branches are apt to occur. For the first time, I saw this trouble appearing on young orchards three years of age or less. Ordinarily it occurs after the first heavy crop or about the time the trees reach 7 or 8 years of age. Because some growers thought the trouble might be due to zinc deficiency I drove in great quantities of zinc triangles into the trunks and branches of trees several years ago. No results whatever have been noticeable from the zinc applications. It has been known that budwood taken from trees having the 'peculiar' trouble will continue this trouble when they are grafted upon normal trees but so far as has been seen the scion does not cause any visible change in the rest of the stock or normal tree. The branches grown from the scions having 'the peculiar trouble' develop the trouble. The trouble, which has been noticeable to some extent for 15 years or longer, seems to be becoming more common in various districts. It occurs mainly upon the Nonpareil variety and sometimes is found on the Peerless."

C. E. Schuster, Corvallis, Oreg.

"The past week has seen some very high temperatures, 95-96° F., with humidity as low as 10 percent," he writes May 13th. "With practically no rain for 60 days the moisture condition is beginning to become critical for some things. Portland, which has had a little more rain than Corvallis, reports 0.6 of an inch of rain since March 15th, and this at 8 or 10 different dates so that the rainfall that has been received amounts to nothing. Strawberries are beginning to be seriously affected. Winter grains are heading out short and early. Spring grains in many cases are not germinating."

NUT INVESTIGATIONS

John R. Cole, Albany, Ga.

"I visited growers that are spraying in the Barnesville, Griffin, and Macon districts during the week," he writes May 6th, from the U. S. Pecan Disease Field Laboratory. "Most of them have finished their pre-pollination spray applications and I was surprised to learn that there was so much difference in the condition of the trees between Albany and Barnesville. The Schley nuts have been pollinated in the vicinity of Albany for several days, while the pistillate flowers are just appearing at Barnesville. In my opinion the trees of the Schley variety are at least three weeks further advanced in the vicinity of Albany than at Barnesville.

"Growers are busy spraying and dusting to control scab from Albany to Atlanta. Only a few growers are dusting but a large number are spraying. Reliable information indicates that between two and three hundred thousand Schley trees will be sprayed and dusted in Georgia this season. Most all makes of machines are being used, from 'home-made' types to the very best ones that money can buy. There are also as many ways of obtaining power for spraying as there are machines. I was especially interested in the satisfactory manner in which the power-take-off machines worked. Most of the machines that were sold this season are the tractor-take-off type, although there is an occasional one of the truck-take-off type. The only place where the tractor-take-off machines do not work satisfactorily is in hilly country where the orchards have been contoured. In these localities short turns are difficult to make.

"The crop of nuts seems to be 'spotted,' with the Stuart having the heaviest pistillate bloom. In fact there is a possibility that we will have as large a Stuart crop as we had in 1931. As is usually the case, where the trees set a light crop last year, they have a heavy pistillate bloom this year. This is especially true in the vicinity of Thomasville and Cairo, Ga. To sum up the crop situation in Georgia: At present the indications are that the crop prospects are about 25 percent better than they were last year on that date."

B. G. Sitton, Shreveport, La.

Writing from the U. S. Pecan Field Station on May 13th he says: "Trees in the Fullilova Cultural Plots that received bordeaux spray last season, in the portion that had half of the trees removed, have a good pistillate bloom, while the unsprayed trees have little or no bloom. Trees closely spaced have little or no bloom on either the sprayed or the unsprayed trees. The only Stuart trees in this 450 acre orchard which have started a crop of pecans are those which were sprayed by Mr. Parson or by me....Spraying with bordeaux assists materially in keeping the foliage on the trees and in storage of food for blossoming the following year."

NUT INVESTIGATIONS

F. W. Dodge, Robson, La.

"A survey of crop prospects on the station for this year shows that this is another 'off' year for Stuart, even though two-thirds of the trees were sprayed with bordeaux. The Stuart crop could not possibly be larger than 500 pounds and most likely will be about 200 or 300 pounds, less than 1 pound per tree. The Schley and Success crop should be about the same as last year with an increase in the Moore and Moneymaker crop. Our total crop should be from 10,000 to 15,000 pounds," he estimates May 13th.

"There will be no crop on the Schley and Stuart trees in the Bermuda plots, and probably about 3 pounds of nuts per tree on the Success trees in these plots. Cultivated Schley and Success trees should produce an average of 15 pounds of nuts per tree. Trees in the rye plots have one-half to two-thirds of the crop of the trees in the legume plots.

"Moore, Mahan, Desirable, Williamson, Bass, James, and Lewis have the heaviest pistillate bloom and should all produce an average of 30 to 50 pounds of nuts per tree this year. If the entire orchard was given cultivation with a winter legume and had these varieties instead of the present ones, we could expect a 50,000 pound crop this year instead of one only about one-fourth that size. Bordeaux spraying last year apparently has not increased the amount of pistillate bloom on Moore, Mahan, Desirable, or Williamson. However, there is no crop on the unsprayed Bass and James trees, and only half a crop on the unsprayed Lewis trees, so that these varieties would have to be sprayed for satisfactory production.

"Results on this station this year again show that the right varieties grown on good land and given proper care will return excellent dividends--better than cotton or any other farm crop."

John H. Painter, Cairo, Ga. (Tung investigations)

"It has been noticed at this station that in the cases where the first blooms had been killed by the freeze, a second bloom came out which was almost entirely male flowers," he writes May 13th. "Now at this late date, three weeks after the last male flowers have been seen, there is a light but fairly general third bloom which is as far as we have been able to find all female. There is a general notion among some growers that the tung doesn't need any pollination. It must be admitted that very preliminary and inaccurate observations fail to disprove this idea so a number of these late female blossoms have been tagged, knowing positively that there is no male bloom present, and these will be visited again later to make observations. This might account for some of the 'pops', those early maturing, or rather dropping fruits which upon cracking have no kernels. It is true in the filbert so may be true here. It is hoped that the tagging of these blossoms will clarify this subject somewhat."

NUT INVESTIGATIONS

John H. Painter, Cairo, Ga. (continued)

"Mr. Lee Hines of the Bogalusa office spent the week ending May 6th here and was shown the principle groves where apparent diseases are present. In digging around the roots of dead and dying trees, Mr. Hines has discovered what he believes to be considerable damage to lateral roots in one grove in which there is high mortality. He is inclined to believe cultivation has been too deep, which is identical with the viewpoint held by the writer and suggested to the grower concerned. Cross cultivation has isolated the trees on a small square patch of soil and in cases where the past crop was heavy the tree was so weakened as to be unable to resist cold."

George F. Potter, Bogalusa, La. (Tung investigations)

"On Saturday morning Dr. Angelo inspected his nursery at the Money Hill Farm near Bush, La. and reported considerable germination of the nuts," he writes May 6th. "There has been some question as to whether or not it is best to hull the nuts before planting them. Some of the nuts from certain individual trees were hulled and some were not. It now appears that nuts without the hulls are germinating more quickly than the others."

"We have been anxiously awaiting the results of our budding work. A variety that will put tung production on a basis much more profitable than the present may be in that nursery. Hence we have been rather breathlessly awaiting signs of growth. An inspection Saturday showed that a considerable proportion of the buds are forcing on the first trees budded. Counts showed 57 to 75 percent of the buds growing on different individual strains. In view of the character of budwood taken from mature trees which in every case had borne a heavy crop of fruit last season, these proportions are considered very encouraging."

"Since we now have in mind the different types of soils on which we desire to locate plots, Dr. Drosdoff and the writer have spent the week prospecting different commercial orchards in which there is a possibility of obtaining satisfactory plots. Our notes indicate that we have found locations in which satisfactory determinations can be made of the relative advantages of at least four types of soil commonly planted to tung trees. After another day of scouting we shall decide which locations are to be used, will mark out the plots and make accurate descriptions of the soil profiles in each....."

"Some study has been made of sections of buds injured by the frosts on February 22 and 23. These indicate that injury is localized at the junction of the undifferentiated region which lies immediately below the flowers and the differentiated region of xylem and pith. The cells show tendencies to turn brown, crack and eventually cause an abscission layer to be formed across the stem. This condition eventually permits the whole bud to drop off. At the present time many frost-killed buds are still retained on the trees but a very slight pressure with the finger and thumb will cause them to be dislodged."

NUT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg.

"Additional evidence that highly alkaline bordeaux mixtures cause more foliage injury to walnuts than neutral or low-lime bordeaux mixtures was obtained in spray injury tests carried on during the early prebloom stage in my experimental orchard at Scholls, Oreg.," he writes May 13th. "The foliage of trees sprayed with 6-6-100 bordeaux was severely injured while the leaves of trees in the plot sprayed with 6-1/2-100 were only slightly injured. Again, the leaves in the plot sprayed with bordeaux mixture 4-4-100 were badly injured while the foliage in the plot sprayed with bordeaux mixture 4-1-100 showed only a trace of injury. No injury whatever could be detected in the plots sprayed with copper oxalate 3-100 and 4-100, yellow cuprous oxide 3-100 and copper oxychloride 3-100... Unseasonably dry weather continues to prevail in Oregon. According to Government meteorologists at Portland, Oreg. the current rainless period which started on March 15 is the driest in the weather bureau's history, which dates back to 1871. At Portland, only 0.6 of an inch of rain has fallen since March 15. The only other corresponding arid period approaching the present record was March 12 to May 16, 1885, when 1.12 inches fell.

Max B. Hardy, Albany, Ga.

"The chestnut trees will be full bloom within a very few days and there is a very good percentage of pistillate flowers showing," he writes from the U. S. Pecan Field Station and Laboratory on May 13th. "The older chestnut trees are showing little or no evidence of winter injury or of the presence of disease, while the young orchard is very ragged looking with many trees dead or nearly so. However, it is encouraging to note that some of the young trees are entirely normal in appearance and are making good growth, indicating that control of disease and winter injury may be accomplished by selection...Reports in regard to pecan bloom indicate as good a crop, and possibly a better one, than last year."

DECIDUOUS FRUIT INVESTIGATIONS

C. O. Hesse, Davis, Calif.

"As the result of unseasonably warm weather almost continually since the latter part of February, the prospects are for an early harvest this year in spite of the relatively late bloom. Cherries are earlier than in any of the last few years, some Chapman having already been shipped from the Sacramento River districts...Peach growers seem to expect prices to range from \$25 to \$30 per ton this year, but to date the canners have made no offers. The carry-over is approximately normal, about 2,000,000 cases, so that prices should be higher than last year. I have heard of no offers to apricot growers as yet, but as most of the early fruit is shipped it is still a little early for offers from the canners. The prospects are for a better than normal crop."

SUBTROPICAL FRUIT INVESTIGATIONS

W. C. Cooper, Orlando, Fla.

"Research on the rooting of citrus cuttings with hormones has shown that out of 30 different varieties of citrus experimented with all have been successfully rooted by the appropriate use of indoleacetic acid combined with bottom heat (85°F.). Leafy cuttings from mature terminal growth from mature trees were used in all instances and hormone treatment consisted of immersing the base of the cuttings in a .02 percent water solution of the hormone.

"The lemons, limes, pummelos, shaddocks, and citranges, which usually initiate 2 or 3 roots per cutting when not treated, produced 10 to 30 roots per cutting when treated with the hormone. The grapefruits, sweet oranges, sour oranges, mandarins, and kumquats, on the other hand, seldom rooted when not treated and never produced more than 3 or 4 roots per cutting even when treated. Indolebutyric acid and naphthalene acetic acid gave about the same results as indoleacetic acid. It was found, however, that if a cutting had not rooted after one month in the propagating frame a second treatment with indoleacetic acid usually enhanced its chance of rooting. Bottom heat was also found to be quite essential for the rooting of oranges and grapefruit, as the use of hormones without bottom heat was ineffective. Limes and lemons, on the other hand, will root without bottom heat, but bottom heat speeds up this process materially.

"This difference in the response to the hormone treatment among the various varieties of citrus is still not very well understood. Ether extracts (Van Overbeck technique) were made of the leaves of the various varieties experimented with and the growth substance content was measured quantitatively by Went's Avena test. No significant difference, however, was found in the extractable growth substance content of the different varieties.

"Cuttings were also made from one-year seedlings of the various varieties and were tested concurrently with cuttings from mature trees. Just as has been found with apples (Gardner's work), cuttings from one-year seedlings of oranges and grapefruit root much more readily than cuttings from mature trees. It was also found that one-year seedling orange cuttings treated with indoleacetic acid gave a large increase in the number of roots as compared with untreated controls. This increase was comparable with that obtained for cuttings of lime and lemon from mature trees. Thus, it is suspected that the one-year orange seedlings contain an unknown factor for root formation similar to that existing in lemon cuttings from mature trees.

"The hormone dust preparations have been tried out on the various varieties of citrus. A dust containing 1 part per thousand of naphthalene acetic acid caused a slight increase in the number of roots per cutting on limes and lemons but this increase was not as great as that obtained by the water solution method. Oranges and grapefruit cuttings failed to show any response to the dust preparations.

W. C. Cooper (continued)

"A good response, however, has been obtained by the dust preparations on many ornamental plants which are now being propagated for the beautification of our new 80-acre experiment station near Orlando. Excellent results have been obtained by the dust preparations on Tibouchina, Oleander, Ligustrum, Viburnum and Camellias. In the case of the Camellias the best results have been obtained by a second application one month after the initial application. By this procedure 25 to 30 roots per cutting can be obtained after 7 to 8 weeks in the propagating frame."

DECIDUOUS FRUIT INVESTIGATIONS

G. A. Meckstroth, Willard, N. C.

Writing from the Coastal Plain Station on May 6th he says: "A freakish rain and hail storm struck at the station on the morning of May 2d. It covered a wide area of the State. It extended northward from Wilmington almost up to the Virginia line and westward beyond Raleigh. It was the worst hail storm this section has seen for about 30 years. Some hail stones were an inch and a half in diameter. I was afraid that these would be big enough to break glass in our greenhouse, but I found that only one pane was broken. The hail did some damage to strawberries, although not as much as I expected. I went to the field immediately after the storm and saw a good many green berries had been knocked off the plants. The foliage, also, showed some sign of injury. A half inch of rain fell the same day. In the afternoon it was unseasonably cold and some growers quit picking for the day on account of the cold. One immediate effect of the unseasonable weather was to boost the price of strawberries to a fifteen year mid-season high. The prices shot from \$3.50 to \$4.00 a 24-qt. crate to \$6.75. Hail damage was reported to berries in the Burgaw, Wallace, Rose Hill and Mount Olive areas. The yields from our plots have dropped off sharply during the past week, but several more light pickings will be made before the crown fruit will be coming in. It appears that we will have a fairly good crown crop. The plants are putting out a heavy crop of crown blossoms....During the past week I examined some plants of the Catskill variety collected at W. C. Fussell's, Teachey, N. C. for the presence of the northern dwarf nematode. I found nematodes in some of the plants, but the population was not as large per bud as it was the last week in March. I also examined a number of plants of the Klondike variety from a field where I observed the dwarf last summer and fall and found nematodes in two out of nine plants. However, the population in these buds was not as high as that in the Catskill plants.

"This year's spraying experiments again clearly demonstrate that spraying controls black seed trouble. We have had less of this trouble this spring than usual on account of weather conditions. Weather conditions this spring have not been favorable to the spread of the strawberry leaf spot fungus. The total rainfall for March was only 2.96 inches and nearly all of this fell the first six days. Infection was general in the fields in February and I thought this would be ideal for demonstrating the value of spraying, but it seems that the long dry period in March and the first half of April checked the spread of the diseases, resulting in foliage free of infection."

DECIDUOUS FRUIT INVESTIGATIONS

George F. Waldo, Corvallis, Oreg.

"The first ripe strawberries were found on May 10 on selection No. 1088," he writes May 13th. "Strawberries will begin ripening in general during the week of May 15 to May 20. The drought continues with generally rising temperatures and a strong north wind, which seems to be drying quite rapidly. The newspaper reports indicate that growers are quite worried over the prospects for crops this year. Indications are that the southern part of the valley is at the present time suffering the most and that the strawberry crop will be shortest in this area. Plantings are reported to be in good shape in the northern part of the valley but continued dry weather will probably cut the crop considerably.

"A great deal of interest is being taken in irrigation. Frost has also done considerable damage in certain localities to strawberries and other small fruits. Some blackberry and red raspberry selections show considerable amount of frost damage. Also certain strawberry selections. Frost was prevalent throughout western Oregon on the morning of April 30 and continued for several nights following."

R. B. Wilcox, Pemberton, N. J.

"Most blueberry fields, except those near the shore, have reached the height of bloom and the corollas are falling from the Cabots in some places," he reported May 13th. "The blight stage of *Sclerotinia* had made its full appearance by the middle of the week and we have been taking careful notes on its occurrence. It was more abundant in the fields to the South, where buds were farthest advanced at the time of infection. The leaf-blight appeared in the Pemberton section when the laterals were much smaller than usual, only about an inch in length, and there is relatively little of it in most places; in other words, during the 'shooting season' of primary spores, the buds were not advanced far enough, in most cases, to permit infection. The heaviest blight infection that we have seen took about one-third of the leaf buds of Adams, the most susceptible variety. Concord, also, showed considerable leaf blight. Cabot showed much less, while Rubel and Jersey had very little. Cabot and Pioneer, on the other hand, showed much direct blight of blossom clusters, in one or two cases the Cabot exceeding 50 percent. A few growers went to the trouble of picking off the scattered blighted tips, in the hope of preventing berry infection, but it is very doubtful whether this was of any value.

"The first blight showed up on young shoots of blueberries May 3 in the most southerly fields, and appeared in fields near Pemberton on May 5th. The first Cabot flowers opened May 1, other varieties following in quick succession. As usual, the appearance of mummy blight coincided with the blooming period.

"Most blueberry growers have now made their first application of fertilizer."

DECIDUOUS FRUIT INVESTIGATIONS

John H. Weinberger, Fort Valley, Ga.

"The first peaches of the season will be picked in orchards near Fort Valley the latter part of this week at approximately the normal time of ripening," he reported May 8th. "Last year the first peaches were shipped on April 28th, in a very early season. Following is the official estimate by carloads of the Georgia Peach Growers Exchange: Mt. Rose (Mayflower) 95 cars; Unceda, 190; miscellaneous early, 215; Early Rose, 660; Hilcy 2630; Belle 205; and Elberta 1562, making a total of 5,557 cars.

"The Elberta crop in Georgia in the last few years has averaged around 5,000 to 6,000 cars, so that the principal reduction in this year's estimate is in that variety. Other varieties are about the same as last year. The above report further stated that the total production of the four southern peach States--North Carolina, South Carolina, Arkansas and Georgia--would not aggregate more than 11,000 cars. In a good year Georgia alone could produce enough peaches to exceed that total."

He had written May 2d: "On a trip to Albany, Ga. yesterday it was still possible to observe the effects of prolonged dormancy on Elberta, Early Rose, Halehaven and Early Elberta, and the set of fruit on these varieties is light. Trees sprayed with dormancy-breaking chemicals are still outstanding in foliage development. Some excellent pictures were made in a Halehaven orchard on the probable relation between high temperature and prolonged dormancy, which may have more influence than generally supposed. Mr. Fugazzi's manager pointed out a small limb on a large Elberta tree which leafed out early in the spring and now has two or three times as much foliage as other limbs on the same tree. It is carrying five fruits, and if they prove to be Elberta we may finally have a bud sport of Elberta resistant to prolonged dormancy.

"About 4,000 Tennessee natural pits were cracked last week and the seed planted in a greenhouse bench saturated with nematodes. In a few weeks the seedlings will be dug and the roots examined in an effort to find a Tennessee natural seedling, an excellent peach stock and prolific bearer, resistant to nematodes. The interest in nema-resistant stock among peach growers is increasing, and several men last week inquired of nurseries having Shalil stock for quotations, on orders from a few hundred to thirty thousand trees, the largest. On the basis of the behavior of year-old Yunnan trees here at the laboratory as regards dormancy requirements, two local nurserymen are obtaining Yunnan stock for establishing their own source of seed. As growers become familiar with nema-resistant stocks, I believe the demand will increase greatly."

In an interesting summary of the past season's observations, he writes: "During the past winter we experienced at Fort Valley 1127 hours of temperature 45°F. or below, a total close to the average for a season, and all varieties of peaches in the variety block have bloomed and are foliating normally. Nevertheless, certain varieties which have a low

DECIDUOUS FRUIT INVESTIGATIONS

John H. Weinberger (continued)

cold requirement, excluding the Honey type, have bloomed as much as 2-1/2 weeks earlier than those having a high cold requirement to break the rest period. Red Bird, Duke of York, Early Rose and Veteran are in this group.

"March 27th observations were made at Albany on the dormancy-breaking experiments. Sprayed trees of Early Rose were about 4 days in advance of unsprayed trees in bloom and foliage development. With Elberta, Halehaven and Golden Jubilee the differences in foliage development between sprayed and unsprayed trees were even more marked. The results at Albany this year are in close agreement with those of last year in that best results are obtained with Early Rose if the sprays are applied after the trees have been exposed to about 650 hours of cold. Last year the most effective date was January 13th; this year February 7th. In the very warm winter of 1931-32 the records show Fort Valley had 740 hours of cold. What a help these sprays might have been that year. This past winter was almost normal as far as cold weather was concerned, and from present appearances it would be advantageous for Mr. Fugazzi to use DN or DNO in a normal or warmer than normal winter on all varieties except Hiley and Uneeda, and possibly on these also. The time of ripening of the fruit will be the final criterion but the fruit on sprayed trees both at Albany and at Fort Valley seems to be retaining at least part of its advantage of earliness.One variety at Albany that Mr. Fugazzi's manager states is Halberta, was still perfectly dormant on March 28th except for certain trees in which dormancy had been partially broken by our sprays applied early in February."

John C. Dunegan, Fayetteville, Ark.

"The effects of the April 6th freeze are now becoming clearly apparent in the apple orchards of the district," he reports May 13th. "The freeze occurred before many of the buds were open and for the past several weeks the growers have hoped that the buds which opened after the freeze would make a crop of apples. These hopes were not too well founded, however, and during this week it became apparent that the apple crop would be much smaller than was anticipated. Practically all of the second or late bloom failed to develop due to faulty pollination and dropped from the trees leaving only a scattered crop. This condition is most aggravated in the southwestern part of the country in the vicinity of Lincoln, is quite apparent in the Fayetteville area, but is less marked to the north toward Rogers and Bentonville....In our experimental spray plots we have a much smaller crop than I anticipated and one or two of the plots do not have enough fruit for experimental purposes. Fortunately the check plots and the Phenothiazine plots have a sufficient number of apples if there is no further drop, to yield disease control data....As the result of the small crop, growers are already talking of abandoning spray operations for the season. Many started late, omitting the cluster bud application, and with the rainy weather of this week it is clear that the apple scab will take a toll of leaves and lessen the chances for a good crop next year."

DECIDUOUS FRUIT INVESTIGATIONS.

Elmer Snyder, Fresno, Calif.

"The grape breeding work for the 1939 season was started at Fresno April 27 compared to May 20 in the 1938 season," he writes May 6th. "To date 2,822 emasculations and pollinations have been made. The earlier blossoming date this season may be due to the warm temperatures recorded during April, the daily excess for the month averaging 6.2°F. above normal...Buds are now being taken from the seedlings in the greenhouse and 'T' budded into stock vines to hasten a fruit reading. This season an average of 250-300 buds have been inserted per day, including necessary notes and labeling...Shoots produced from last year's buds are now showing fruit clusters."

ADMINISTRATIVE NOTES

Air Travel The News Letter of November 1, 1938, called attention to new tariffs for travel by commercial air lines, and conditions governing the use of this means of transportation. In connection with this method of travel, Memorandum No. 817 issued by the Secretary under date of April 29, 1939 amends Section 8 on page 3 of Standardized Government Travel Regulations by striking out the second, third and fourth sentences of paragraph one, inserting in lieu thereof the following:

Transportation by commercial air lines may be authorized or approved by the head of any department, establishment, or agency, or by any of their designated subordinates, in cases where (a) the cost thereof, taking into consideration salary and subsistence savings is not in excess of travel by other usual means of public transportation, or (b) there is no other usual means of public transportation available, or (c) in emergencies where necessary for saving life or property.

When the cost of transportation by air is in excess of the cost of other available transportation, taking into consideration salary and subsistence savings, and there is no existing emergency involving the loss of life or property, transportation by commercial air lines must be specifically authorized or approved in each case by the head of the department, establishment, or agency concerned.

Where travel is performed under the conditions outlined in (b) and (c) the voucher on which reimbursement of expenses is claimed must be supported by a statement in triplicate, subject to verification, that no other usual means of public transportation was available or that the use of air lines was necessary for the purpose of saving life or property, as the case may be.

Employees should make this revision in their copies of the Travel Regulations, with appropriate reference under paragraph 3439 of the Regulations of the Department of Agriculture..

 ADMINISTRATIVE EXPENSES

Automobiles: Since the issue on May 1, 1939 of the revised office Maintenance Upkeep "Memorandum Regarding Automotive Equipment," we have received Office of Budget and Finance Circular No. 115, dated April 29, 1939, which clearly defines items chargeable to limitation on automobile repairs as follows:

Items Chargeable to the 1/3
Replacement Value or the
\$400 Lump Sum Limitation:
(Maintenance and Repairs)

Items not Chargeable to the 1/3
Replacement Value or the \$400
Lump Sum Limitation:
(Operating Expenses)

Accessories (repairs and re-
placements, but not original
purchases)
Anti-freeze compounds
Batteries, replacements
Battery charging
Battery rental
Painting
Reconditioning of integral
parts
Repair labor
Repair parts
Seat covers (replacements)
Towing (if for purpose of re-
pairing)
Washing, polishing and waxing

Garage rent
Gasoline, oil and grease
Greasing
Pay of operators
Storage
Tires
Tire boots, chains, linings,
mountings, repairs and
replacements
Towing (other than for purpose
of repairing)
Tube repairs and replacements
Tubes

The classification of expenditures as above should be followed in submitting the monthly report of operating expenses of Government-owned passenger-carrying vehicles.

A notation should be made on the "Memorandum Regarding Automotive Equipment", mentioned above, concerning this revision--Budget and Finance Circular No. 115.

In this connection, too, we hope that you are following the suggestion made a number of times in the News Letter concerning keeping accurate records of expenditures in connection with the car you operate. The suggestion, if you missed it, was that every official vehicle should be provided with a notebook, either carried in the front of the car or hung in some manner on the dash, so that every item of expense may be entered at once before it slips from your mind. Such a note book will prove invaluable in connection with your reports.

Vol. 11 No. 11

June 1, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I M O N T H L Y N E W S L E T T E R

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and are not necessarily the official and final word on the subjects.

Vol. XI U.S. Horticultural Station, Beltsville, Md. June 15, 1939. No. 12

Nutrition Science for May 12, 1939, prints the thought-provoking address of Dr. Auchter as retiring vice-president and chairman of Section O (Agriculture) of the American Association for the Advancement of Science, "The Interrelation of Soils and Plant, Animal and Human Nutrition."

"Basically, what is this problem of human nutrition which is so vital in human well being?" he asks. "It is a problem of crop production, of food production. That is the most familiar of all problems to agricultural scientists. But hitherto we have thought of it too largely in terms of quantity--including factors that interfere with quantity production, like plant diseases and insects. It would be no revolutionary step for us to think in terms of nutritional quality as well. We have demonstrated that we have the personnel, the training, the facilities and the equipment to make some very significant contributions. We agricultural scientists have felt a strong responsibility for quantity production in the United States. Surely it is just as much our responsibility to further the production of foods of the highest nutritional quality--in other words, to dovetail agricultural production with human physiological needs; to move toward a better nourished nation."

He points out that a study of the factors involved in the production of food of high nutritional value may mean that we shall find that certain crops should be grown only in definite regions, or that elements lacking for the production of crops of superior nutritional value be added if practicable. This would mean, of course, food of high nutritional value for those living in the particular regions -but it would also mean that foods shipped from those regions would be equally valuable to consumers everywhere.

"It may also mean, among other things, that after thorough surveys and investigations certain soil areas may be found inefficient and undesirable for the production of food, although possibly suitable for the production of crops for certain industrial uses or for forests, parks or recreational centers. It may mean that only certain crops should be grown in certain areas or that it will be necessary to add small quantities of essential but deficient elements in a routine way through fertilizers, irrigation water or sprays to the soil or plants in some areas, so that the people dependent upon the crops in such areas will, automatically and perhaps unknowingly in most cases, have food of high nutritional quality. Any foods shipped from such areas would be equally valuable to consumers everywhere."

The importance of continuing investigations to determine which elements are essential not only for the best development of plants but for the production of the highest quality plants, which, when consumed, will meet the nutritional requirements of man and animals is evident, he said. Many factors affect the growth of plants and their value as food.

"Nutrient materials must be either in solution or capable of becoming dissolved at the margin of the root hair before they enter the plant body. After their entrance, they become a part of the vast complex of compounds that make up the plant body, and when the plants are consumed by man or animals the nutrients included become part of their bodies. It is the capacity of green plants for manufacturing food--for accumulating energy as food--that makes them prominent in any system of economy dealing with living things. Green plants, in the presence of sunlight, accomplish this by combining the carbon dioxide of the air and water to form carbohydrates. The minerals and other substances absorbed by the plant from the soil, water or atmosphere are combined with carbohydrates or other materials formed from them and help to make up such compounds as proteins, fats, vitamins and other growth and regulatory factors. These combinations of foods, both simple and complex, found in plants, are the chief source of energy and are essential for the health of man and animals. The importance, therefore, of producing plants of the highest nutritional quality can easily be appreciated...."

"I shall not attempt here to suggest exactly where such lines of research would lead," he said in concluding. "But I am sure that one of the most fundamental steps would be a thorough study of our soils from the standpoint of their suitability or unsuitability for the production of certain foods--including the possibility of amending them, if it can and should be done, so that they will give the people who live on them, not just so many pounds of food, but all the complex and subtly balanced nutrients we human beings need. Certainly by this means, general health will be improved and there should be little if any need for adding supplements to the daily diet, except temporarily in certain cases."

SUBTROPICAL FRUIT INVESTIGATIONS

W. W. Aldrich, Indio, Calif.

"Considerable time this spring was devoted to the development of plant material for study. At the Martinez Research Station (located 12 miles south of Indio and operated in cooperation with the Office of Indian Affairs) all vacancies or weak palms in the plantings of young Halawy, Zahidi, Dayri and Thoory date palms were reset with vigorous offshoots. The poor growth in these plantings has apparently been due to poor penetration of irrigation water high in sodium. A fair stand of Hubam clover seems to be helping water penetration but is requiring irrigation every 10 days. Sulphur, gypsum and double irrigations are being tried as additional means of increasing water penetration. We are exploring the possibilities of this saline soil (typical of that in many Indian reservations) for citrus by planting of Marsh grapefruit on 4 rootstocks and by a planting of Satsuma oranges. Trees that survive both the salts and the winter cold may have value for Indians.

"At the U.S. Date Research Garden the young Khadrawy date planting is doing nicely. The Deglet Noor and Mejhool date planting in the sandy soil at the west end of the station are not as satisfactory; and we are trying more frequent fertilization this season. Next spring 200 trees of Marsh grapefruit on sour orange stock will be ready for planting in the old cotton field north of the laboratory. Vacant land near the residences has been planted to some of Snamel and Pomeroy's more promising orange strains. One of the grapefruit strains is being compared with Marsh, both in the open and in the shade of palms. Four of the more hardy avocado varieties are being observed under shade conditions of lath house and of palms. Young plants of Fairchild, Orlando and Florida will soon be ready for transplanting to three soil types in the lath house and also to field rows in the open and in the shade of palms.

"Studies of the effects of deficient soil moisture upon the quality of fruit of the Deglet Noor date are being enlarged this season, with plots at both the Cavanagh garden and the station. While Moore is helping with the leaf growth and Crawford with the fruit maturity records, Furr will be down in July to help with study of the effect of humidity upon cracking of fruit. I shall repeat the measurements of weekly increase in fruit dry matter, made for Martinez plots in 1938.

"The study of factors affecting the set of fruit of citrus has been enlarged to include trunk girdling and pruning of Washington Navel orange in the Riverside area, and irrigation of Valencia orange in the Fullerton and San Dimas areas. The study of application of growth promoting substances upon set of Washington Navel, carried on largely by Pomeroy, was repeated this spring.

SUBTROPICAL FRUIT INVESTIGATIONS

W. W. Aldrich (Continued)

"The low market prices for the approximately 17,000,000-box Washington Navel orange crop just picked, and the uncertain prospects for the 25,000,000-box crop of Valencia oranges (from 1938 bloom) are making growers increasingly critical of costly production methods. This desirable attitude by growers is putting an increased responsibility upon research men to obtain accurate data upon citrus tree responses to cultural and climatic conditions. Therefore we are increasing our efforts to learn under field conditions more about the effect of soil moisture, soil aeration, soil nitrates and leaf area upon the number of fruits produced per tree, and upon the size and quality of the fruit. In the case of Bearss lime we hope to change the time of maturity of the fruit by an old principle previously studied on lemons by Furr."

BOOKS AT FIELD STATIONS, ETC.

Employees at stations where reference books are kept will be interested in a release from the Press Service, dated June 4th, explaining a useful method of preventing mildewing of covers.

"This summer when the relative humidity goes above 60 percent, either cloth or leather bound books are likely to mildew while on the shelf," it says. "Any binding material that will absorb water is a likely host for fungus growth.

"The best way to prevent mildew is to keep the books in a dry place. Books can be kept dry even in humid weather, say specialists of the Federal Bureau of Chemistry and Soils, by placing one or more cans half-filled with lump lime on the shelf behind the books.

"This lump lime absorbs air moisture and keeps the relative humidity below the danger point. Cans should never be more than half filled, since the lime expands as it absorbs the moisture and is likely to overflow on the shelf. The lime should be replaced when it becomes pulverized by air slaking.

"A covering of colorless lacquer prevents book covers from absorbing moisture. This treatment also is recommended to halt the ravages of roaches and water bugs on book covers."

NUT INVESTIGATIONS

B. G. Sitton, Shreveport, La.

"In the J. C. Nickerson orchard at Lafayette a block of trees had been plowed about 6 or 8 inches deep when the leaves were about half grown," he writes from the U. S. Pecan Field Station on May 20th. "Lower branches had defoliated to at least 50 percent and in some instances more. Apparently the basal leaflets of the older leaves shed first and later the rachis dropped. Upper branches were not so seriously defoliated. Adjoining trees which had been plowed a week or so later did not show severe defoliation, only an occasional branch having lost some of its leaves.

"Plowing was deep enough to cut roots running almost parallel to the surface of the ground and all of the verticle rootlets from these, so that there must have been a severe check in the water supply to the trees.

"Near Lafayette we observed damage by an insect identified by L. O. Ellisor, Louisiana State University, as Cacoecia infumatana, apparently a new species, not reported as feeding on pecan trees previous to 1938. This insect ties the leaves of one shoot together in a bunch in which it apparently stays during the day. The larvae feed on foliage of other leaves on the branch and may completely defoliate the branch. Those colonies examined contained from 10 to 20 larvae, which when full grown are about 1 inch long and 1/8th of an inch through. The body is green, a black head, and 4 rows of black dots."

George F. Potter, Bogalusa, La.

(Tung investigations)

"The nursery plantings, although made rather late in the season, show an excellent germination," he reports May 31st. "Mr. Bateman, of Bogalusa Tung Oil, Inc., pronounces our cooperative nursery with them one of the best that they have ever had. Nuts from the Florida, Georgia and Louisiana laboratories have apparently all germinated equally well. Those from this station were kept all winter in the basement of the Post Office at a constant temperature higher than 70° F. If subjection to a period of low temperature were necessary before germination could take place, the results would have been very unsatisfactory. We are all much gratified at the outcome.

"Some of the nuts were entirely separated from the hulls of the fruits before planting. In other cases the whole fruit was soaked and each nut planted with a portion of the hull adhering. It has been the opinion of some tung growers that this hull would hold moisture and accelerate germination. The concensus of opinion among staff members was that the obvious capacity of the hull to absorb water would rob the nut of water and delay germination. Under the conditions prevailing this spring, when a considerable period of dry weather immediately followed the planting, the nuts with the hulls attached have germinated definitely more slowly than the others."

NUT INVESTIGATIONS

George F. Potter, Bogalusa, La. (continued)

"Our research project on relation of soil type to growth and production of tung trees is now completely set up," he reports May 20th. "Work on this project was begun April 17 in cooperation with Dr. M. Drosdoff of the Division of Soil Survey. For ten days we explored soils in tung orchards from Stone County, Mississippi on the east to St. Helena Parish, Louisiana on the west. Mr. Fowler, District Supervisor for the Soil Survey, then spent three days with us in identifying the various series we had found. Our objective has been to set up plots at points where different soil types are found within fields of one age, under the same ownership and management. After a period of scouting for most advantageous locations the actual work of marking out the plots was begun about May 10 and was completed during the past week.

"There are no recent soil surveys in Pearl River County, Mississippi, or Washington Parish, Louisiana. Although Ruston was formerly considered the predominant soil type of this area, we found very few orchards on a soil which, according to present day standards, would be mapped as Ruston. Two soils were found very commonly. One of these is similar to Ruston but heavier and underlaid at from 24" to 40" by a comparatively heavy mottled layer of parent material. It occurs mostly on the slopes and on narrow ridge tops. On large high plateaus a soil is commonly found which formerly might have been classified as Norfolk but is now known as Pheba. In the upper layers this soil is very similar to Norfolk but at 18" to 24" considerable staining is found, and at 24" to 40" there is a cemented layer of mottled gray material.

"It was decided that a better estimate of the reliability of the results of this experiment will be obtained if several small plots rather than a single large one of each soil series were used. The ideal set up would be to have a group of small plots in relatively close proximity, comprising one each of the various soil types to be tested, this group to be replicated several times. However, it is not possible always to obtain exactly the groups desired. It was felt that with the heavy Ruston and Pheba series a considerable number of plots could and should be established and that the variation found in these would give some measure of the reliability of results with other less important soil series with which only one or two plots could be established. Accordingly there have been set up four plots of 25 trees each of the heavy Ruston in which the heavy parent layer occurs within 30" of the surface, and eight plots of 25 trees each in which the parent layer occurs at from 30" to 40" depth. Similarly there are four plots of the Pheba soil in which the heavy layer is within 30" of the surface and six plots in which the compact layer is at a depth of 30" or more.

NUT INVESTIGATIONS

George F. Potter (continued)

"Besides these two most important series we have established four plots of the true Norfolk soil, two on the true Orangeburg, two on Cuthbert, which is a very heavy, tough Ruston, two on Caddo, a gray soil type which occurs in depressions on the highlands, and two on Sawyer. Sawyer formerly would have been classified as Susquehanna, but has a rather well developed B horizon of yellowish sandy clay between the surface soil and the tough plastic gray mottled parent layer. No plots were established on the true Susquehanna in which this impervious layer occurs within a very few inches of the surface. It is felt that such soils are so obviously unsuitable that any investigation would be beside the point...

"Mr. Hines returned to Bogalusa on May 16 after spending approximately five weeks in the States of Florida, Georgia, Alabama and Mississippi, for the purpose of making a disease survey of the tung area. A survey of Louisiana and parts of Mississippi is yet to be made.

"In spite of the popular reports that the tung tree is relatively free of disease, a few trees were found dead or dying in every orchard visited. The prevalence of diseased trees ranged from a trace in the better kept orchards to practically 100 percent in the more-or-less abandoned orchards.

"Without doubt the tung tree is very sensitive to adverse growing conditions and it is probably true that many of the diseases are due to physiological disorder brought about by such causes as deficiency of certain nutrients, lack of cultivation, crowding and poor drainage. All of the above are predisposing factors for the attack of pathogenic organisms. A large majority of the pathogenic diseases of tung can probably be controlled by remedying these adverse environmental conditions. For example, in one poorly drained orchard approximately 75 percent of the trees were infected with root-rot producing fungi, while in well drained orchards one rarely finds more than a trace of infection.

"Cold is apparently another important factor in the predisposition of the tung tree to the invasion of pathogenic organisms, such as those causing dieback and cankers."

John H. Painter, Cairo, Ga. (Tung investigations)

"Incomplete germination counts were made at the nursery planting at Lloyd, Fla. at the beginning of the week," he writes May 20th. "The germination while still not complete shows considerable variation between selections. One selection, Mississippi No. 84, is still 100 percent blank. Upon examination the seed appears perfectly normal. It is possible that the shell is a bit harder on this particular sample than the others and that may account for the delay in germination. It is the only one acting that way."

DECIDUOUS FRUIT INVESTIGATIONS

Elmer Snyder, Fresno, Calif.

Writing on May 27th he says: "Grape buds taken from seedlings in the greenhouse on April 26th have now produced shoots two feet and more in length. On account of the warm temperatures during April, the buds were inserted somewhat earlier this season and have made rapid growth with good prospects of fruit next season. The budding work is still in progress as some of the weaker seedlings were allowed to continue growth in the greenhouse so that more suitable buds could be obtained...."

"Temperatures during the week ranged from a minimum of 48°F. to 100°, according to our thermograph readings in the shade. Where fruit clusters were exposed to the afternoon sun, some slight burning was noted, when the temperature reached the 100° level at this stage of berry development!"

He had written May 20th: "The 1939 grape crosses at Fresno were completed on May 17th. Ten thousand blossoms were emasculated and pollinated this year. The blossoming period extended from April 27th to May 17th, nearly three weeks, during which time several hundred vinifera varieties were in various stages of blossoming. In general the blossoming period of a single vinifera variety extends over a period of 10 days to two weeks, affording ample time for the breeding work. At Fresno the blossoming period starts with the resistant rootstocks, followed by American native varieties, then the vinifera varieties, and ending with the rotundifolia species."

John H. Weinberger, Fort Valley, Ga.

"Uneeda harvest in this section is about to wind up today although it will be several days before Early Rose peaches start," he writes Dr. Cullinan on May 29th. "Red Bird are now ripe in the variety block, and a few Duke of York peaches are soft."

"Thirty-eight different seedling peaches from crosses made at Beltsville in 1936 have been described, and some of them are quite promising. All but a few Red Bird crosses are yellow-fleshed, and nearly all are highly colored with fair quality. Size ranges from 1-3/4" to 2-3/4". All are clings, which perhaps is to be expected this early in the season but a number of them are rather firm, and ripen uniformly from the pit outward, with a firm suture. The pale-green Uneeda peaches being shipped from here now do not compare in appearance with these round, brilliantly colored fruits. Seven varieties used in eight crosses are responsible for these early peaches. They are Dewey x St. John, Halehaven, Sunbeam, Red Bird, Rochester, Marigold, and Maxine. Halehaven and Red Bird crosses are the firmest, and the former are the most promising, although some beautiful 2-1/2" Sunbeam specimens of excellent quality have been picked. I am hoping to find a freestone seedling ripening in the near future."

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Wilcox, Pemberton, N. J.

"The final effects of the heavy frost of May 15th are still appearing on blueberries in the form of a heavy June drop," he writes June 3d. "The original crop estimate for the State, made by the Blueberry Cooperative Association, was for about 140,000 crates. This estimate has now been cut officially about one-third and it is not certain that the bottom has been reached. This falls within the limits of our estimate made two weeks ago. Some fields, including the seedling plantation at Weymouth, are almost a complete loss, while in a few places the damage is very slight. The first application of blueberry fertilizer had been generally applied before the frost, and where the crop has been badly damaged the bushes are making a particularly rapid growth.

"Not all of the reduction in the New Jersey blueberry crop can be blamed on the spring frost. Part of it was due to the combination of circumstances which resulted in unsatisfactory wood growth last year. Some fields bore a very heavy crop but most fields suffered from excess water or even floods. Finally, the temperature last fall did not decline gradually so as to harden the wood, but winter weather came suddenly at Thanksgiving time with a strong west wind and low temperatures. As might be expected, the result in damage varied with the drainage of the fields and the condition of the fields, being negligible in some places but culminating in one field in the death of many Pioneer bushes and severe injury to the wood of all varieties; this field has fertile fruit now, although it was not severely frosted in May.

"The same condition during last summer and fall caused injury to a number of cranberry bogs. In most cases it was due to repeated floods during the growing season, with occasional oxygen deficiency. On one large bog, however, evidence indicates that the length of time that the bog was submerged during September and October prevented proper hardening of the vines, and the winter weather at the end of November caused severe injury. Vines along the ditches are apparently normal; elsewhere, the buds and wood are almost completely killed to within an inch or two of the ground, where they apparently became covered with snow before being injured. This bog is being heavily fertilized to stimulate new growth. A number of other bogs showed the same type of injury in a milder form. Damage to cranberries from the frost of May 15th was negligible...

"We discovered one case of extreme interest in regard to varietal susceptibility to blight. The June variety blighted very little in most places. However, we found a few bushes of June which had been budded several years ago on Adams stock and to our great surprise more than half the leaves on these June were killed by blight. It appeared certain that the Adams stock had given its susceptibility to the June wood. We intend to make cuttings from these June bushes to see whether they retain this susceptibility after removal from the Adams stock."

DECIDUOUS FRUIT INVESTIGATIONS

H. F. Beraman, East Wareham, Mass.

Writing from the Cranberry Disease Field Laboratory on June 1 he says: "Leaf drop, due to oxygen deprivation during the winter flooding period, appears to be quite widespread on cranberry bogs in Massachusetts this year. Several cases where over considerable areas of the bogs the vines have been nearly defoliated have been reported to me and also a number of others where the injury was less severe. One grower who for many years has had trouble with leaf-drop sprayed his bog two years ago with bordeaux giving two applications and has continued the practice since and has had little or no leaf drop. Last year he was able to spray only once on account of wet weather. I visited his bog one day and although a little leaf drop was evident it was not nearly as bad as it was in other years before he began spraying. Three or four other growers intend to spray their bogs this year on account of leaf drop. One grower has about 50 acres of bog that will be sprayed....."

"The weather this week has been much warmer. There was frost on two nights making it necessary to flood bogs but even that is much better than the week preceding when there was frost for seven nights in succession with temperatures ranging from 19°F. to 25°."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

N. H. Loomis (Small fruit Investigations)

"The past week was devoted largely to routine activities," he writes May 27th. "Peaches and all young grapes were fertilized. Grape breeding work was continued. Youngberries were harvested between showers."

"Although the amount of rain was not heavy, showers were frequent, yet the quality of the berries was very good and not nearly as soft as expected. The Oregon 73 dewberry has been much softer than the Youngberry, yet of good quality. It will never compete with the 'Young' in this section. The Thornless Young (U.S. Plant Patent No: 4) is again giving excellent yields and although slightly smaller (averaging 140 berries to a 680-gram quart where the Thorny 'Young' averages 120) it will probably displace the Thorny type. Cameron dewberry, which is fruiting here for the first time, has given fine, firm fruit of good quality but light yields."

He had written May 20th: "The final harvest of strawberries was made this past week, although there are some varieties that continue to bear comparatively heavy second crops. The yields however were too light to warrant further harvests. All pickings from the Marion strawberry section this week have gone to Birmingham, Ala. by truck for the frozen pack trade. The first Youngberries were harvested May 17th."

DECIDUOUS FRUIT INVESTIGATIONS

George F. Waldo, Corvallis, Oreg.

"Most of the week of May 22-27 was taken up in a trip to experiment stations and growers in eastern Washington and eastern Oregon,--Pasco and Kennewick, Washington; and Milton-Freewater, Hermiston, and Hood River, Oregon. In most sections the Fairfax strawberry is quite popular, being an early berry and a very good shipper of fine quality. The Wray Red and Dorsett are also grown to a considerable extent. Although several of our selections showed promise in these districts, they lack redness, which is very desirable at the present time in varieties grown in the lower Yakima and Walla Walla valleys. Several selections showed promise in the Hood River valley."

ADMINISTRATIVE NOTES

Injuries to The Chairman of the United States Employees' Compensation
Employees. Commission has written the Department as follows:

"The Commission has noted an increase in the number of cases in which claim under the Federal Employees' Compensation Act is made by an injured employee for the payment of privately incurred medical bills for treatment obtained on account of an injury in localities where Government medical facilities are available for such treatments.

"The excuse generally offered in explanation of the failure to utilize Government medical facilities is that the employee was not informed of the availability of such facilities, or as to the provisions of the compensation law requiring the use of these facilities for the medical care of employees claiming the benefits of the Compensation Act. It also appears that many supervisory officials and employees responsible for authorizing medical care in case of an injury to employees under their supervision are not informed as to the proper procedure to follow in such matters."

While we do not believe this applies especially to our Division, in view of the fact that we have consistently kept our field offices informed on procedure, by means of mimeographed instructions, memoranda, and News Letter items, we take this opportunity to again emphasize the necessity for every employee of this Division to become thoroughly familiar with the instructions on procedure as well as the duties of the official superiors and the employees with respect to injuries sustained in the performance of duty.

It is again pointed out that the benefits of the Federal Employees' Compensation Act apply to individuals employed under letters of authorization as well as those under regular appointment. Therefore, it also behooves every Collaborator and Agent authorized to employ labor needed in caring for our experimental work in the field to familiarize himself with the instructions. The Business Office will supply mimeographed instructions and forms to all who have failed to receive them, and will be glad to answer such questions as may arise from time to time.

PICNIC

Our sixth annual Division picnic was held at the Horticultural Station, Beltsville, Md. the afternoon of June 3d, centering at the "Log Cabin" in the woods and spreading out through the surrounding grounds. It was in many ways the most successful of the gatherings so far held, with a splendid attendance of present and former employees and their families, including three out-of-town visitors: Mr. W. T. Pentzer from Fresno, Calif., Dr. Paul L. Harding from Orlando, Fla., and Mr. James E. Kraus from Cheyenne, Wyo.

It wouldn't be fair to attribute the conspicuous success of these annual picnics to chance. No, the various committee members put in a lot of work to make sure that every one will have a good time. Mrs. Marion H. Harvey, who is in charge of the financial records of the Division, headed the reception committee this year and did an excellent job. Mr. J. H. Beattie and his refreshment committee held fast to this group's popularity, dispensing hot coffee, lemonade and ice cream to supplement the lunches brought by those in attendance. The coffee deserves special mention. Made by Mr. W. R. Beattie it met with a remarkable reception and many, including Dr. Crane, who finished five cups, were led to wonder if this coffee-making accomplishment may not have played an important part in gaining for Mr. Beattie the "most outstanding citizen" award from his home county. He, however, with his usual modesty insists that he made the coffee too weak and so it was necessary for Dr. Crane and others to drink several cups in order to get the equivalent of one cup of good coffee!

Probably the feature of the picnic was the soft ball game between teams representing the Beltsville station and the Washington office. The Beltsville Battlers won by a margin of 11 to 8 and for the third consecutive year Dr. Magness is listed as the winning pitcher though he had excellent help this year from Bob Thompson, who pitched part of the game. Moon and Smallwood did the catching. Herb Block and Maurice Vail shared pitching duties for Washington, while Bob Linehan, an excellent first baseman, surprised by taking over the catching job. Magness and Thompson did not confine their activities to pitching exclusively, each blasting out a homer. Another pitcher, Block, accounted for the third home run of the game.

Just to prove to Dad that he isn't the whole show in the Magness family, young Robert Magness won the cup offered by Dr. Auchter to the child of an employee able to name correctly the largest number of a group of plants and trees marked out in the picnic area. Bob placed the correct tag on more than half of them and was presented with the cup by Mr. Gould in the absence of Dr. Auchter. Olive Baxley, secretary to Dr. Boswell, won the prize as rapid-fire interviewer.

As usual, the picnic included such events as archery, horseshoe pitching, boating--and a soft ball game for the girls.

ADMINISTRATIVE NOTES

Leave for Temporary Employees As defined by the Department Regulations, a person will be considered as a temporary employee and leave allowed on that basis (1) When the termination date of employment is fixed in advance for a period not exceeding 6 months regardless of whether a definite stop date is given or the appointment reads "Not to exceed 6 months"; and (2) When appointment is made for 1 month or more (up to 6 months).

Temporary employees, as classified above, will earn 2-1/2 days annual leave per month for each full month of service. However, leave cannot be granted such employees until after the first full month of service. Thereafter leave may be granted at the beginning of the month in which it accrues. Thus an employee appointed June 1 for a period of not to exceed 6 months could not be granted leave with pay during June, but on or after July 1 he could be granted the 2-1/2 days leave earned in June and if desirable also the 2-1/2 days credited to him for the month of July. The employee should, of course, be allowed to take all the leave to his credit prior to the termination of his appointment.

Employees under definite appointment, temporary or permanent, are entitled to sick leave at the rate of 1-1/4 days per month. Sick leave accruing during any month of service shall be available at any time during the month. Temporary employees, as defined in the opening paragraph are not entitled to an advance of sick leave.

Employees hired at a rate per day or hour for intermittent service are not entitled to annual or sick leave. As all employment under Letter of Authorization in this Bureau is restricted to intermittent service, employees under Letter of Authorization are not entitled to sick or annual leave.

Sales Tax The Business Office has had several inquiries as to the proper procedure to follow when making a purchase in California, where a sales tax is involved. The Comptroller General has ruled recently that the Federal Government is exempt from such tax and therefore if the dealer insists on payment of the tax the purchase may be made (including the tax) but a Form 1094 (U.S. Tax exemption certificate) should be filled out, to be signed by the dealer, in the lower left-hand corner, and attached to the voucher. An extra copy of the voucher should also be sent to the Business Office. The amount of tax should be shown as a separate item on the voucher and the serial number of the certificate given, together with a statement that the dealer refused to grant tax exemption. In such cases the statement "State or local sales taxes are not included in the amount billed" should be crossed out on the voucher certificate. The tax exemption certificates and extra copies of vouchers will be used by the Government in claiming a refund of the taxes paid. Tax exemption certificates may be obtained from the Business Office. (This same procedure, of course, is to be followed in other States where a State sales tax is demanded in connection with official purchases.)

Vol. 11 No. 12

June 15, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

SEMI MONTHLY NEWS LETTER

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI

Horticultural Field Station, Beltsville, Md.

No. 13

July 1, 1939.

Strawberries To those of us who have watched the extremely satisfactory progress of the strawberry breeding work conducted by Dr. George M. Darro and his associates, it comes as no particular surprise to read in John C. Dunegan's report in this issue that the Blakemore strawberry was the principal variety marketed in northwest Arkansas this season. It made up about 75 percent of the strawberries sold. It may be news to some, however, that the Blakemore has become the leading strawberry variety in acreage in the United States!

The strawberry breeding program is a very comprehensive one, including attempts to obtain strawberries of improved dessert quality and varieties especially suited to the needs of the industry. We want big berries, too, husky specimens that along with their other good qualities will run 40 to the quart--or even fewer--just so buyers do not confuse them with apples! It remained for the boys in the Department's Press Service, however, to enlighten the News Letter concerning another phase of the program--I mean the fact that Dr. Darrow and his force sample the promising new strawberries with their nose as well as their tongue. They keep in mind, you see, the fact that the strawberry derives its scientific name "Fragaria," from the Latin for fragrance.

"For aroma and delicious strawberry flavor, there is nothing to beat the wild eastern meadow berries that the earliest settlers on the Atlantic coast found so delightful," says the Press Release in question. "George Darrow has sampled most of the good berry varieties of the world and knows none with finer aroma." So there's the additional problem--retaining this aroma in the new sorts. In many hybrids it is lost, but it persists in some crosses that have the other desired qualities also, and it is from this group that winners such as the Blakemore are chosen--the--er--nosegays of the strawberry breeding program!

DECIDUOUS FRUIT INVESTIGATIONS

John C. Duncgan, Fayetteville, Ark.

"At Springdale, Ark. about 200 bushels of Transparent apples, the first of the season, were on the market on June 12 and brought \$1.80 for the best grade and \$1.50 for No. 2 quality. The apple crop is short," he added, writing on June 17th. "Raspberries brought \$4.00 for pint crates; Youngberries \$1.35; cherries \$2.75 for crates of 24 quarts."

He had written June 10th: "Much time this week was devoted to the collection and examination of the 'drops' from our apple spray plots. The results of the first collection are not completed for all the plots but 90 percent of the fruit from non-sprayed trees show scab lesions while only 0.5 percent of the fruit is infected in one of the lime sulphur plots."

For the week ending June 3d he reported: "Bacterial spot is beginning to appear on peach foliage as the result of the very favorable infection conditions during the month of May. In one 20-acre block of 18-months-old Elberta trees the grower reports that disease appeared very suddenly on all the trees at the end of last week. I examined the orchard on May 31 and found the most serious case of leaf infections I have ever encountered. Many of the leaves had the upper half completely infiltrated with bacteria, giving the leaf a 'glassy' translucent appearance.

"When the harvest of strawberries in Washington County is finished within the next few days, a gross return of \$300,000 will have been brought to farmers of the county, County Agent Clifford L. Smith estimates. About 350 cars of berries have been shipped by truck and rail and Mr. Smith's estimate of the cash return is based on an average of \$2.00 per crate. Actually the berries sold at an average of \$2 to \$2.10 per crate, he said. Seventy-five percent of the berries were marketed at Springdale, but Prairie Grove, Farmington, Lincoln and Fayetteville marketed part of the crop.

"Blakemore was the principal variety marketed this year, 75 percent of all those sold being of this variety, with the other 25 percent distributed principally among Klondike, Aroma and Norwood."

H. F. Bergman, East Wareham, Mass.

Writing from the Cranberry Disease Field Laboratory on June 7th, he reported that blueberries were in full bloom, with good prospects for a big crop.

DECIDUOUS FRUIT INVESTIGATIONS

J. R. Kienholz, Hood River, Oreg.

"Stony Pit of Pears.--Examinations of the pear nursery plot planted for the purpose of observing leaf symptoms of the stony pit virus, have shown several interesting developments," he reports June 1. "What was thought to be healthy Bosc and Patten budwood apparently was infected. At least, growth from these buds has developed leaves showing what is believed to be the leaf symptoms of stony pit. In checking the new growth from the trees selected for this budwood, the new leaves were found with the same symptoms. Quince, Forelle pear, and Anjou growth on the nursery trees appear to be healthy at this time and should offer some material for budding and transmission experiments. The encouraging feature of these observations is that nursery stock may offer possibilities in identifying the disease.

"It is becoming somewhat evident that the leaf symptoms are variable and often fugitive. The youngest leaves on diseased trees generally show a faint mottling and some veinlet chlorosis. As the leaves mature, the mottled condition disappears. The veinlet chlorosis may persist, generally on a small percentage of the leaves, and is often a striking and definite symptom. On most varieties observed, however, the veinlet chlorosis may also be erratic, in that leaves showing striking symptoms at a certain period of development may later mask the chlorotic areas completely out.

"Several pear varieties worked on a diseased Bosc tree previously show little evidence of the trouble except in the case of Pyrus communis. A small number of the leaves on this variety show the most striking veinlet chlorosis yet observed. These are being tagged and a record of their performance will be taken. Leaves of the diseased Anjou trees budded in 1936 showed some beautiful chlorosis several weeks ago, but they have largely disappeared at this time....

"Powdery mildew is very common on apple twigs and pear fruits. It is difficult to convince growers that mildew is a dry weather fungus. Dieback is common in many orchards and no doubt is directly correlated with a lack of moisture last fall and during early spring. Winter temperatures are too mild for injury.

"At my request, one grower applied 33 pounds of borax per acre to his alfalfa field. While this was applied very late, the results are strikingly good. A distinct line separates the treated from the untreated stand and the former is greener, taller, and will far outyield the untreated plot. Boron deficiency symptoms are clear cut in the untreated plot."

DECIDUOUS FRUIT INVESTIGATIONS

E. S. Degman, Medford, Oreg.

"The soil moisture availabilimeter, developed by Mr. R. B. Allyn, has now reached the point where, from a practical standpoint, it can take the place of the oven method of determining soil moisture," he reports from the U. S. Pear Field Station.

"Its limitations as far as soil type goes have not been determined, but it works very well on our adobe and similar soils here. The Fruit Growers League is now having one built for the County Agent to use in helping the growers determine the proper time to irrigate. The chief advantage of the instrument lies in the fact that one can save 24-48 hours as well as the expensive equipment necessary to determine soil moisture by the oven method."

U. S. HORTICULTURAL FIELD STATION, MERIDAN, MISS.

J. M. Lutz (Handling, Transportation and Storage Investigations)

Writing June 3d he says: "The tomato season opened at Crystal Springs on May 31 and because of almost continued rains, with resulting severely diseased condition of the vines, it looks as if the major portion of the crop will be shipped by June 10, although there will be some shipments after that time. Shipping quality of tomatoes this season is reported as not entirely satisfactory. Cracking is quite severe, as would be expected. There seems to be little blossom-end rot this year."

Atherton C. Gossard (Nut fruit investigations)

"The mechanical analysis of the soils in the selected areas of the pecan orchard was completed," he writes for the week ending June 3d. "The size of particles at successive foot levels to a depth of 9 feet tend to be similar in the two areas in which the trees grow well, the particles increasing in coarseness with the depth of sampling. The size of particles from the two higher areas of apparently drier soils, on which the trees grow relatively poorly, tend to be similar, being nearly as coarse at all levels as the coarsest particles from the better areas.

"Two profile pits were dug to a depth of 9 feet, 1 on each of the higher, poorer areas. The pecan roots from specific distances from similar trees and from specific foot levels to 6 feet were saved for weighing, measuring and photographing. It appears that this soil examination may be quite revealing as to the causes for differences in the ease of establishment and the growth of pecan trees in various locations in our orchard."

SUBTROPICAL FRUIT INVESTIGATIONS

R. B. Piper, Orlando, Fla.

"Planting operations at the new U. S. Subtropical Fruit Research Station, comprising 80 acres on the south shore of Lake Hiawassa near Orlando, have progressed rapidly," he reports June 15th.

"We now have 10.5 acres planted to avocados, including a plot for nutrition studies and others for testing rootstocks, varieties and hybrids. Early in February 9 large avocado trees, from 14 to 18 years old, were moved from the Orlando Laboratory grounds after being cut back to about five feet, leaving only the trunks and a portion of the main branches. After four months these old trees show vigorous growth, some having shoots from 12 to 18 inches in length. Some 75 5-year-old avocado seedlings that had survived temperatures of 23°F. or lower without injury were planted in the hybrid block. Some of these also showed resistance to avocado scab.

"Three and one-half acres of the citrus variety collection are now planted. This collection contains most of the named commercial varieties of citrus, tested hybrids and species. Most of the trees in this block are from 8 to 20 years old and were moved from Orlando, Drake Point and Eustis. Nearly all show vigorous growth. One and one-fourth acres of the citrus breeding block have been planted. Some of the hybrids in this block should fruit for the first time next season.

"The lychee block contains 2-1/2 acres and includes a variety collection planted as buffers between the main planting for nutrition studies. About half of the three-acre mango block has been planted. We have also planted a few jaboticabas and expect to have 2-1/2 acres set out this summer, the trees being imported from Brazil. One acre of papayas has been set for nutrition and breeding studies and 1500 pineapple plants have been set, the number to be increased before the end of the season.

"One-fourth of an acre has been devoted to miscellaneous subtropical fruits, including white sapote, guava, tree tomato, rose apple, Achras Sapota, etc.

"Many subtropical ornamental trees and shrubs have been used to beautify the station grounds. Palms are the main landscape feature. Hundreds of ornamentals are being propagated this season and will be used for future landscaping of the grounds.

"Windbreaks of Casuarina equisetifolia and C. leptidophloia have been planted on the west and north sides of the property not bordered by the lake, and on the south side of the central farm road."

NUT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg.

"Final results of cross-inoculation studies made in the fall of 1938 were taken during the week, he writes June 10th. "Puncture inoculations made in filbert branches, in 1938 growth with 5 different isolates of the filbert blight pathogen were positive in practically all cases, killing back the inoculated branches from 3 to 12 inches in most instances, while no lesions or only very small dead areas, not exceeding 2 mm. in their maximal diameter dimensions, were present about puncture inoculations made in filberts at the same time with 5 different isolates of *Phyt. juglandis*, the walnut blight pathogen. The results of these cross-inoculation studies afford additional evidence that distinct differences in pathogenicity between these two pathogens exist even though they can not be separated by morphological or physiological methods...."

He had written June 3d: "The latter part of the week was spent mostly in taking final results of greenhouse studies on the critical period for the infection of filbert buds by the filbert blight pathogen. As stated in an earlier preliminary report, results of these studies indicate that the buds are susceptible to infection by the blight pathogen practically the whole year around, as artificial inoculations made at approximately monthly intervals from June 1, 1938 to April 1, 1939 were always positive in some instances. The most critical part of the infection period is apparently the interval from June 1 to January 1, however, for inoculations made during this period caused the death of a much larger percentage of buds and opening shoots coming therefrom than did inoculations made thereafter."

"Brown scorch, a non-parasitic disorder of walnut leaves, continues to develop in abnormal proportions, he commented in his report for May 27th. "Specimens have been sent into the office by growers from all sections of the Willamette valley and from as far south as Grants Pass, Oreg. These inquiries, together with personal observations, indicate that this disorder is more prevalent and severe than it has been for a number of years past."

George F. Potter, Bogalusa, La. (Tung investigations)

"Rapid progress is being made in the study of the effect of tree vigor and tree location in relation to fruit bud development and resistance to frost injury," he writes June 14th. "There is some indication of a correlation between high starch content and frost resistance. Sections made of the pith region immediately below the buds and stained with IKI show heavier starch accumulation in buds which resisted killing frosts."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

Writing from the U. S. Pecan Field Station and Laboratory on June 17th, he says: "The drop records taken this week showed a definite relationship between the drop of nuts and our experimental pollination treatments. This drop occurred during the fifth week from full receptivity and corresponds with the time of drop noted in previous years. It is to be expected that all the unpollinated nuts will be off the trees by the time drop records are taken during the coming week."

He had written June 3d: "To date there has been a general drop of nuts on all varieties not associated with the experimental treatments applied. A small portion of this drop has been due to injury by the nut case bearer but the cause of most of it cannot be definitely determined. Nuts are developing rapidly in size."

"'Scorch' on the leaflets on trees in certain portions of the Brown orchard at Philema is developing rapidly in spite of the abundant rainfall which has occurred. Apparently, the presence or lack of sufficient soil moisture is not a prime factor in the development of this leaf condition unless its effect on the condition of the tree in regard to root and top growth occurred prior to the present growing season. Tree growth this year is more vigorous than has been noted for several years."

"The crotalaria cover crops are the best we have had for some years. In the Brown orchard at Philema, especially in the portions of the orchard on the sandier soils with low fertility, the stand is the best we have ever had. However, along the tree rows in the area cultivated three times last summer plants are few and small, even around the trees in the area on which fertilizer was spread, demonstrating the deleterious effects of clean cultivation."

George E. Schuster, Corvallis, Oreg.

"The walnut crop is going to be considerably shorter than last year," he writes June 10th, "while it is evident that the filbert crop will be very heavy."

"This has been a season of extreme variation in blooming; a modified form of delayed foliation is quite prevalent. In one orchard which we visited last week, there were still pistillate flowers in just about the receptive stage, while on the same trees would be walnuts 1/4 grown."

HANDLING, TRANSPORTATION, STORAGE AND MARKET DISEASE INVESTIGATIONS

Edwin Smith, Wenatchee, Wash. (and in transit !)

"After several years' experimental work with atmospheres of CO₂ gas as an auxiliary to refrigeration in the transportation of sweet cherries and Bartlett pears, certain shippers in Yakima are placing 700 to 800 pounds of 'dry ice' in refrigerated shipments of sweet cherries to provide CO₂ atmospheres in transit," he writes June 21.

"The 1938 transportation test from the Pacific Northwest on this subject showed that refrigerator cars were variable in their retention of the gas and that, generally, low concentrations obtained after three or four days movement of the cars, despite the presence of a liberal amount of 'dry ice' within the cars. During the cherry shipping season this year Fisk Gerhardt and A. L. Ryall are making laboratory studies of the effects of these decreasing concentrations of CO₂ upon cherries under refrigeration and are placing withdrawal tubes in refrigeration cars carrying commercial shipments under gas."

In this connection, Edwin Smith went to Laramie, Wyo. to secure analyses of atmospheric samples withdrawn from the cars passing that point between June 18 and 25, whereby a comparison may be made between gas retention in a series of shipments and that secured in the transportation test of last year. And thereby hangs a tale, because he took advantage of an interruption of this work to make a trip to the Cheyenne Horticultural Field Station--and was he impressed!

"Dr. A. C. Hildreth will do his best to make a Rocky Mountain botanist in one day's time out of any member of our staff who may visit his station!" he writes during his convalescence after a walking tour of the station's 2,139 acres. "The station seems amply protected from the Indians," he volunteers by way of reassuring us. "To reach it you pass through Fort Warren, the second largest encampment of soldiers in the United States. Just beyond the fort and rifle range 6 miles from the city one passes through the dignified rose-colored sandstone gate of the station and views the semicircle of residence and buildings against a rise in the plains about a mile distant with 10-acre test plots intervening. My visit deeply impressed me with the amount of time and work necessary to establish the wonderful showing of protective and ornamental plantings about the station--the energy and perseverance necessary in botanizing throughout the Rocky Mountains and the Great Plains, from Alberta and Saskatchewan to New Mexico, to secure the material represented. For that matter, imagine the hiking required to accumulate the 42,000 native strawberry plants, representing 1100 different collections, being tested at the station for hardiness, disease resistance, etc. and being used for selections in breeding work! And this is merely a sub-project!"

HANDLING, TRANSPORTATION, STORAGE, AND MARKET DISEASE INVESTIGATIONS

Top-to-Bottom Ventilation "Taking advantage of a simple rule of nature--that cold air presses down--scientists of the Federal Bureau of Plant Industry devised a new method of ventilation which makes it possible to handle long-distance shipments of citrus, other fruits, and vegetables with a minimum loss from extreme temperatures, both cold and warm," says a release from our Press Service, discussing an interesting phase of our transportation work.

"The cars in which perishable fruits and vegetables are shipped were built primarily for refrigeration. In winter months, however, when ice is not needed and outside temperatures are not too cold the vents over the ice bunkers are left open to let air circulate through the car while in transit. The cold air enters the car through the opening at the bottom of the bunker, masses under the load and stays there. As a result, the lower part of the load often gets too cold while produce at the top of the car may get too warm. Under this method ventilators must be closed when the outside temperature reaches 32 degrees, or fruits and vegetables near the floor may freeze.

"In the plan worked out by C. W. Mann of the Bureau, heavy paper, canvas, or light metal is placed over the openings at the bottom of the bunkers. This forces the air coming in from outside through the top bunker opening and over the top of the load where it filters down. In this way the top of the load gets the benefit of the incoming cold air and there is no quick massing of cold air at the bottom of the car.

"During 2 years of tests with citrus shipments from California, it was found that vents could be left open until outside temperatures reached as low as 25° without injury to the fruit. During the present season the method has been applied also to citrus shipments from the Rio Grande Valley of Texas. This improvement in ventilation will make it possible for shippers to shorten the season when produce must be precooled before shipment or be shipped under refrigeration, says Mr. Mann. Further studies on ventilating other produce during transit will be conducted by the Bureau.

"Since demonstrating the effectiveness of top to bottom ventilation, Mr. Mann has devised an adjustable panel which can be attached permanently to the ice bunker openings to replace temporary baffles used in the tests. The Department of Agriculture has applied for a public service patent to insure its free use by all shippers."

ADMINISTRATIVE NOTES

Rocky Mountain Spotted Fever A memorandum from the Office of the Director of Personnel calls attention to the death, by Rocky Mountain Spotted Fever, of Dr. Dana Manners, a Washington pharmacologist, and reminds us that June, July and August are the months in which everyone, particularly those who work or take their recreation out of doors, should exercise great care to prevent receiving the infection through the bites of infected ticks or through inoculation of small open wounds with the blood of ticks.

"Effective precautions can be taken to prevent infection as eight hours attachment and feeding are necessary before the spotted fever germ can be communicated," says the Memorandum. "A simple method of prevention is to inspect the body and clothing twice each day whenever there is a question of exposure to ticks. Removing the ticks from the body with tweezers will prevent infection through small skin abrasions and cuts on the fingers. Iodine should be used to paint the spot where the tick was attached. Tweezers should also be used in removing the tick from domestic animals, pots, etc. The ticks should be dropped into a can of kerosene or carbolic acid."

Dr. Manners was the third case reported for 1939 and the first death. There were 8 cases in 1938 with 3 deaths resulting. In certain mountain areas in the western States, this ailment is more prevalent and the mortality rate much higher than in Washington. All field forces should be warned of the dangers of tick bites and required to follow the simple preventive measures. The U. S. Public Health Service has developed a preventive inoculation for the disease. Workers in areas where it is more prevalent should be governed by the advice of Public Health service physicians.

Automobiles The question has recently been raised as to whether field employees driving Government-owned automobiles are compelled to observe local ordinances specifying safety requirements for vehicles. The Solicitor has stated that we can not be compelled by law to comply with local requirements, such as brake inspection and the display of a brake tag on the windshield or exhibiting more than one rear light, etc.; however, it has always been our policy to observe State and local requirements intended to safeguard the public, except, of course, where the expense is exorbitant or in excess of the cost and repair limitations.

Paragraph 1832 of the Department Regulations provides the necessary authority to meet any reasonable expense involved in complying with State and local laws and regulations. "Drivers of all departmental vehicles shall strictly observe all State and local laws and regulations both in letter and spirit," it says. Public good will is essential and it can not be gained or held by disregarding the laws or customs of any community. Accordingly, it is considered advisable for those in the field who are responsible for Government-owned vehicles to cooperate with the State and local authorities by the close observance of all requirements intended for the greater safety of the public.

 ADMINISTRATIVE NOTES

Long distance Telephone calls Under a recent ruling of the Comptroller, all official long distance telephone calls must now be supported by Form AD-102. Therefore, an employee making such calls should fill out and certify Form AD-102 in triplicate and forward in duplicate with the supporting voucher to the Washington office where Form AD-102 will be approved by Mr. H. P. Gould or his designated alternate. The third copy should be retained in the files of the office making the call. This applies also where official calls are received collect.

The same procedure should be followed by employees when in travel status paying cash for official long distance calls; that is, the certified Form AD-102 in duplicate should be attached to the reimbursement account.

Toll calls appearing on 1034 vouchers or reimbursement accounts will be suspended unless supported by properly certified AD-102.

Employees maintaining copies of Department Regulations should make notation of the foregoing on paragraph No. 1674.

Airlines In a memorandum from the Chief of Bureau dated June 5, 1939, we are informed that the Civil Aeronautics Authority has approved amendments to the tariffs of the airlines listed below permitting a 15 percent reduction effective June 1, 1939, from published one way air fares, sleeper charges and excess baggage rates to Government employees on official travel; Eastern Air Lines; Pennsylvania Central Airlines; Transcontinental & Western Air, Inc.; and United Air Lines.

Payments for Metered charges Budget and Finance Circular No. 116 reads, in part: "Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Act approved April 27, 1937 (Public Numbered 57), is amended to read as follows:

"Hereafter, in making payments for commodities or services the quantity of which is determined by metered readings, such as gas, electricity, water, steam and the like, and for telephone services, where the period covered by the charge begins in one fiscal year or allotment period and ends in another, the entire amount of the payment may be regarded as a charge against the appropriation or allotment current at the end of such period."

The amendment differs from the original Act, that is, only in that telephone services are included.

Vol. 11 No. 13

July 1, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

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Vol. XI

Horticultural Field Station, Beltsville, Md.
July 15, 1939.

No. 14

Tung Writing from the U. S. Field Laboratory for tung investigations, Bogalusa, La., George F. Potter reports June 22: "The budding nursery has been rechecked and rogued. Every stump on which the bud is not now growing has been removed. The tung tree suckers freely and we want to take no chances of mistaking suckers from unbudded stumps for our vegetatively propagated varieties. At the same time the final data was taken on the percentage of buds to grow and some interesting facts were brought to light.

"The percentage growing ranges from 96 in the case of the variety M-28 down to 10 percent for the variety F-89. Much of this variation is no doubt due to the character of the budwood used. The fact that we have obtained a poor stand with buds from certain trees does not necessarily mean that the same will be true when we use vigorous budwood from our multiplication nursery, yet we strongly suspect that the readiness with which the buds will force may be an inherent characteristic of the individual tree. For instance, the wood from tree A-1 seemed to be vigorous and very desirable, but only 28 percent of the buds grew. The wood from tree A-4, taken the same day and budded at the same time, seemed much less desirable, yet 70 percent of the buds have grown. Again we are able to remember clearly that the wood from the last two trees that were propagated, M-31 and M-32, seemed uniformly poor, but taken at the same, held under precisely the same conditions, and budded the next day by the same person, we obtained 40 percent in the case of M-31 and 92 percent in the case of M-32. If the ease of budding varies with different individual trees, experiments on budding conducted with wood from only one or two trees would be quite inadequate.

NUT INVESTIGATIONS

George F. Potter (continued)

Tung Investigations

"Owing to the fact that it was necessary to obtain multiplication wood from 50 individual trees, experiments on the methods of budding were necessarily very limited. The patch method was used exclusively. In a number of instances it was impossible to find good 1-year-old budwood. A close examination showed many blind nodes, even on trees that made fairly good shoot growth in 1938 and in our notes made last fall were credited with having good budwood. On the majority of these trees, however, a good growth had been made in 1937 and vigorous buds had been formed which still remained in dormant condition. Hence for 6 individual trees, buds from 1-year-old and from 2-year-old sticks were compared. With these particular trees 70 percent success was attained with buds from 2-year-old wood and only 43 percent with the 1-year-old bud sticks, a highly significant difference. It must be remembered that these were trees in which the 1-year-old wood was particularly weak and undesirable. Yet the results with buds from 2-year-old wood compare well with those ordinarily attained with good 1-year wood.

"Another comparison was made of two methods of removing the buds from the bud sticks. One method derived from practices used in budding rubber, consists of cutting a small chip from the sticks, and removing the bark by peeling it back with one hand while with the other the chip is bent. The theory is that by bending the chip its fibers are torn apart and the bud is pulled out of the wood with less injury than were the bark is 'slipped' from the stick. Under the binocular a limited number of buds actually appeared to be in better condition when peeled from the chips in the manner described. The experiments indicate that with buds from 2-year-old sticks results with the two methods were almost identical. Buds from 1-year wood of five different trees shows 65 percent growing when the ordinary 'slip' method was used and only 46 percent when the 'chip' method was used. The results varied widely from tree to tree and therefore even this large difference between methods is scarcely significant statistically. We are inclined to think, however, that when the budwood is small the ordinary method is to be preferred because it gives a much wider piece of bark for the patch."

Max B. Hardy, Albany, Ga. (U. S. Pecan Field Station and Laboratory)

"Rainfall during the month was of nearly daily occurrence although the total amount received was not excessive," he reports July 1. "The trees in this section of Georgia are showing the effects of the more than adequate moisture in the best growth the writer has ever seen. In many instances second growth is making its appearance. There is also more scab on the trees at Philema than in any previous year observed. The crotalaria cover crop is excellent. As yet relatively little shuckworm injury has been noted in any orchard."

NUT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg.

"The forepart of the week ending June 17th was spent largely in a field survey of the distribution and prevalence of brown leaf scorch of walnuts. The disorder was found to be present in varying amounts in all sections of the Willamette valley visited. It is more prevalent and severe than it has been for a number of years past. In some orchards this leaf spot is present in such great amounts that it has decreased the functional leaf area to such an extent that it may affect the filling of the nuts adversely.

"In general, it is worse in orchards on marginal soil types that are characterized, in the main, by relatively shallow soil, lack of optimum aeration in the lower soil levels and poor drainage. On the better soil types the disorder is present in only limited amounts. A number of the affected leaves were examined in the laboratory for the presence of a parasitic microorganism in the tissues but without success. This disorder appears, therefore, to be a physiological or functional disturbance brought on by certain prevailing weather conditions and enhanced by unfavorable soil factors."

F. N. Dodge, Shreveport, La.

"It is apparent that the crop of crossbred pecan nuts will be several times greater this year than any year in the past," he writes June 24th. "It is also apparent that the secret of getting a good set is pollinating at the proper time, and that that time lasts not more than three or four days."

----- ADMINISTRATIVE SPECIAL -----

Effective June 26, 1939, the working hours for all employees of the Department of Agriculture in Washington, D. C. (including the groups at Beltsville, Md. and Arlington Farm, Va.) were changed from 9 a.m. to 8:30 a.m., with the day closing at 4 p.m. week days and 12:30 p.m. on Saturdays. These hours are to be observed during the summer months.

Members of our field staff who have occasion to send telegrams or other rush messages to Washington should bear these new closing hours in mind--4 p.m. daily; 12:30 p.m. Saturdays--so that they may take into consideration the time differential for their region. Messages should be marked "NIGHT" if their delivery in Washington, D. C. will be after 4 p.m.

DECIDUOUS FRUIT INVESTIGATIONS

M. A. Smith, Columbia, Mo.

Writing from the Fruit Disease Laboratory on June 22d he says: "The 1939 pear, apple and peach crop outlooks in Missouri all appear to be above average, according to the June 1 estimates of the U. S. Department of Agriculture recently made public. April frost damage was spotted, the report says. Apples are 59 percent of a full crop as compared with 55 percent average; peaches are 46 percent of a full crop; and pears 48 percent as compared with a 10-year average of 43 percent. Frost did heaviest damage to peaches in the east-central, south-central and southwestern districts, with the southwestern district reporting only 28 percent of a full crop. Peach production is indicated at 912,000 bushels or 11 percent above the average. Pear production is indicated at 390,000 bushels, or 7 percent above the average."

G. A. Meckstroth, Willard, N. C.

"Last week I was called out to a farm a few miles from here where the grower reported that most of his strawberry plants were dying," he writes from the Coastal Plain Station June 17th. "Upon investigation I found that the trouble was due to root aphids. I made a count to see what percentage of the plants were infested. Out of a total of 80 plants, only 17 appeared to be free of ant and aphid infestation; 32 plants showed ant infestation, 6 were weak and 25 dead. This means that less than 25 percent appeared to be free of ants and aphids.

"This field was planted to corn and soybeans last year. In an adjoining field where a portion of the field was planted to corn and soybeans last year and a portion to tobacco, there was a very marked difference in the number of infested plants. The stand was much better on the portion of the field that had tobacco last year. This observation is in accordance with observations we have made for the last several years, since we have found numerous cases where ants and root aphids have been very serious in strawberry fields that had been planted to corn and soybeans the year before. This grower has put in corn in a portion of the field and is saving a few of the best rows hoping that these will make a fair stand of plants for fruiting next year."

John C. Dunegan, Fayetteville, Ark.

"The 'drops' from the apple plots were collected during the week by dodging between the showers," he writes June 24th. "The peak of this work has passed and we were able to gather all the drops in one half day. An examination of the trees in the check plots showed many sporulating scab lesions on the leaves and fruit. The showery weather and moderate temperatures have prolonged the scab infection period this season beyond that of any season since I came to Arkansas in 1928."

SOIL MOISTURE AND FRUIT GROWTH

Experiments conducted over a period of years in cooperation with the Bureau of Agricultural Engineering, in citrus orchards of the south coastal basin of southern California, indicate that fruit measurements of the lemon at least may be used under commercial orchard conditions to establish the most desirable interval between irrigations. "It is not recommended that fruit-growth records be used to predict when water should be applied, but rather that they be used to determine whether or not established practices are accomplishing desired results," say J. R. Furr and C. A. Taylor in Technical Bulletin 640, "Growth of Lemon Fruits in Relation to Moisture Content of the Soil," issued in May.

"If fruit growth decreases materially before irrigation and there is a sharp increase in volume just after irrigation, it is evident that there was an appreciable water deficit prior to irrigation," they point out. "The magnitude of the difference in apparent growth rate during the periods just before and just after irrigation is an index of the water deficit to which the trees were subjected just before irrigation."

Citrus orchards in this south coastal basin require irrigation throughout the dry season from about May to November. "Winter rainfall is usually sufficient to moisten the entire root zone of citrus trees so that for a period in early spring the trees have a full reservoir of soil moisture. As this supply becomes depleted, irrigation water is applied. The application may be such that the entire root zone is again moistened to field capacity, but more often water is applied to a limited portion of the root zone, in some cases 50 percent or less. The remaining soil then becomes quite dry."

There is an amazingly wide difference of opinion among growers concerning times and methods of irrigation, rather natural in view of the fact that they are producing fruit under a wide diversity of conditions, a situation that at least in part probably justifies the opinions expressed. The investigations reported on in this bulletin were conducted in order to establish basic information for promoting better methods of applying water in practice and to provide for the most effective utilization of water by orchard trees. As stated, the work deals primarily with the response of lemon trees to decreasing soil moisture under orchard conditions. Both the effect of irrigating various proportions of the soil in the root zone and that of varying the intervals between irrigations have been investigated.

"The reaction in the trees throughout the range of readily available soil moisture and in the range of moisture percentages at which wilting of the trees occurred have been studied in certain detailed tests as a basis for the larger field trials," say the authors.

DECIDUOUS FRUIT INVESTIGATIONS

E. S. Degman, Medford, Oreg.

"Summer weather has been with us the past few days, with maximum temperatures in the 90's," he writes June 14th from the U. S. Pear Field Station. "The hot dry weather is putting a crimp in the blight movement. Some of the orchards are just getting their first irrigation. This delayed irrigation is partly due to the unwillingness of the growers to apply water while blight is running and partly due to lack of time (men employed in blight cutting.)"

"The fourth cover spray has just been applied. This spray was omitted last year and it is pretty generally felt that it was a mistake. There doesn't seem to be as high a correlation between moth flight and worm entry as has been formerly supposed. Some work done last year by one of the spray companies indicated that maximum entry occurred about 10 days after the lowest flight."

"We now have two fruit measuring instruments in operation, one in each half of Frequent. From the results secured to date, it seems clear that pear fruits here grow somewhat differently than apple fruits in Wenatchee. Our Anjous are increasing in volume now at the rate of about 1cc per day. However, from 7 a.m. to 5-6 p.m. they lose about 1-1-1/2 cc. Then during the night they make this loss up and in addition make their 1 cc of growth. At the present time the fruit on the alfalfa half shrinks more during the day and grows more at night than the one on the cultivated half. However, fruit measurements on several trees in the two halves indicate that both plots shrink and grow about the same. There may be differences in leaf-fruit ratios here, if so adjustments will be made or another tree selected."

"Dr. L. P. Batjer visited the station June 14-17th. It was a genuine pleasure to talk with him and get some ideas from him, as well as to get late news of the Horticultural Field Station at Beltsville, Md., and learn that the new building on the station is so nearly completed, together with new greenhouses, a new heating plant--and a new fence around the station!"

H. F. Bergman, East Wareham, Mass.

Writing from the Cranberry Disease Field Laboratory on July 1, he says, "Thursday forenoon I went through the strawberry district around East Falmouth and Wauquoit. Most of the growers were through picking but a few had two or three days more to go. The crop was very short this year as a combined result of loss from late frosts, dry weather and spring dwarf. The one grower who had most of the spring dwarf, picked only about 300 crates instead of the 600-700 he might have had

DECIDUOUS FRUIT INVESTIGATIONS

H. F. Bergman (continued)

from the area planted. He figures that he has made only about \$75.00 for the year's work. Another grower at Wahquoit who has never had any of the spring dwarf picked 21,000 quarts and still had berries for two or three days more picking. The minimum price that he had received was 11 cents a quart and from that up to 20 cents or more at the first of the season. He had picked more berries from two acres than some other growers had from five although his crop was much less than in some other years....A heavy rain through this area June 30th was generally beneficial for all crops except strawberries. Blueberries look very well and are quite large but will not begin to ripen for another two or three weeks."

He had written June 29th: "The first application of spray for control of fruit rot of cranberries was made this week on three series of plots on separate bogs. In spite of a cold spring which delayed growth for 10 days to 2 weeks early in the season, cranberry vines have caught up and are just coming into bloom this week, which is about the usual time. Several growers have shown an interest in spraying for rot control this year and at least three growers have sprayed areas ranging from 10 to 25 acres, using a 5-2-50 bordeaux. There may be two or three others who did some spraying this year also.

"On June 12 and 13 several plots on a bog badly infected with rose bloom were sprayed for its control. The sprays used were bordeaux 4-1-50, 5-2-50, red copper oxide-bentonite 2-2-50, and yellow copper oxide 1-1/2 - 50. The effects of the sprays were evident this week. Bordeaux sprays were more effective in checking the disease than the copper oxide sprays and bordeaux 5-2-50 was outstanding in the rapidity and completeness of control. Only one application of spray was given at the rate of about 250 gallons per acre."

R. B. Wilcox, Pemberton, N. J.

"The blossoming of cranberries is scattered over a fairly long period, but we are now somewhere near the average peak of bloom for the state," he writes July 1. "In general, the blooming is quite satisfactory, being moderately heavy on most bogs. All spray programs have been started and most of the growers are applying bordeaux throughout the blooming period in order to cut down the amount of fungus blast. The seedlings at the plantation at Whitesbog are growing particularly well and most of them are in bloom. It has not been possible to apply the second bordeaux spray as yet. The work on weed control has been progressing and will be finished within two days, weather permitting. Runners have all been 'tucked in.' The patch is in much better shape than at any previous time.

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Wilcox (continued)

"The blueberry harvest is well under way. There was a falling off in crop at the end of the first week of picking but shipments are now rising rapidly as the berries are ripening in most fields. However, the estimates for the whole New Jersey crop continue to fall and it is obvious that the total crop will be considerably under that of last year, probably not more than half of the original estimate for this year. Fruit worms in the early berries are more abundant than they have ever been before, and mummy berry is both widespread and serious. The obscure blueberry disease on which we have been working is showing up plainly in many fields, particularly on the Pioneer variety. The berries on affected bushes, as reported last year, remain small; leaves and wood growth are much reduced in size; and the leaves of severely affected bushes are somewhat cupped upwards with pale margins. Some injury has developed in many fields, evidenced by the browning of leaves here and there, which is apparently connected with the fertilizer that has been used. The symptoms are more abundant on the light soils and show only where the fall recommendation of fertilizer had been applied. In most places this injury is not serious."

He had written June 24th: "Blueberry picking started in many fields on the 19th but has been very light, less than 250 bushels having been shipped from New Jersey during the week. It is becoming apparent that the crop will be considerably short of that of last year. I understand that the price received for North Carolina was quite satisfactory but the market fell off sharply as soon as the first few shipments were made for Jersey, and the outlook for local growers is discouraging."

"The cranberry seedling plantation at Whitesbog is much more vigorous now than it has ever been. The earliest varieties have passed the peak of bloom while the latest ones have not yet begun to open their flowers."

"We have been finding an increasing number of cranberry bogs that have been weakened or damaged by water last year and by the severe weather at the end of November. Most of these bogs are receiving applications of fertilizer (first week in June) to stimulate growth. Fertilizer is also being applied to many other bogs on which growth is subnormal. One of the objections to cranberry fertilization in the past has been the stimulation of excessive weed growth, but the tendency at present is to attempt control of these weeds by chemical applications. This is bringing about a new set of conditions that may give unexpected and interesting results...."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

George P. Hoffman (Vegetable crop investigations)

"Farmers in this section are badly behind with their crops because of continuous rain," he writes for the week ending June 17th. "Much of the corn has had no work since planting and is now in such condition as to make cleaning impossible. Cotton is at a standstill because of too much rain and grass and is heavily infested with boll weevil. Oats and vetch planted for feed crops have to a very large extent been lost entirely or damaged to such extent as to make very poor feed.

"Spring and summer gardens are good with snap beans being abundant. Peaches, dewberries and wild blackberries are plentiful but of poor keeping and table quality. Pecan growers report good growth and a fair crop promise. Observations made here and there indicate very heavy vegetative growth in both peach and pecan trees....

"Tomato harvest in the variety-selection and cultural blocks is at its best. Yields are fair to satisfactory but keeping quality of the fruit is poor. Glovel and Marglobe have both gone down with wilt in our plots this year. Foliage vigor in several of the selections is conspicuously good and suggests strong resistance to leaf spot.

"Conditions in the Crystal Springs district with respect to the tomato crop this season are pathetic--much reduced yields, low grade fruit, much disease, unfavorable conditions for harvesting and handling, and resulting low prices. The needs of this section appear to be a combined production and handling educational program involving the best possible thought of both extension and research workers. Such program could well begin with the selection and use of soil, both plant bed and field, on which tomatoes have not been grown almost from year to year for 10 to 25 years, more careful observance of cultural practices demanded for optimum plant growth and development, and last but by no means least, a community-wide sanitary program by which to dispose of culls that remain in the fields on the dump, and in the roadside ditches. This last mentioned condition greets the possible buyer, reporter, or otherwise "tomato minded" person and greatly depresses the markets to say nothing of the large quantity of this cull fruit that is or might be taking the place in consumption that should be filled by good fruit sold at a worthwhile figure.

"Out plots are showing worthwhile and interesting differences as to treatments and varieties. However, the short season of harvest--only 17 days--is going to reduce the value of the field readings that we had hoped to obtain."

DRY SODIUM CHLORATE SAFER THAN SPRAY SOLUTION IN KILLING WEEDS

"Spreading dry sodium chlorate crystals over weed infested areas is a much safer way to apply the chemical weed killer than applying it in a solution with a sprayer," says L. W. Kephart, weed specialist of the Bureau of Plant Industry, quoted in a recent Press Release.

"The chemical is widely used for eradicating noxious perennials, including bindweed, Canada thistle, Johnson grass, leafy spurge and Russian knapweed. Because it destroys all vegetation, but leaches out so that the land can be used again in from 1 to 2 years, farmers are using increasing amounts of the chemical although it is both costly and dangerous to handle.

"Last year," Mr. Kephart reports, "more than 8,000,000 pounds of sodium chlorate was applied by farmers many of whom still use the more dangerous spray system. Sodium chlorate by itself is not dangerous, but once the chemical becomes mixed with any organic substance it becomes highly inflammable. This may happen if the chemical spills on a wooden floor or wagon bed, especially if these are dusty. The greatest risk of personal injury is to workmen applying the chemical as a spray, for they can scarcely avoid getting their clothes soaked with the solution. As soon as dry, the chlorate impregnated clothing will flame up from the least spark. This danger is largely avoided when the chemical is applied in the crystal form.

"Most farmers applying the crystals use a hopper mounted on wheels that spreads the chemical such as fertilizer is spread by grain drill attachments. It is necessary, however, to spread the crystals by hand in fence rows or other tangled places.

"For safety the chemical is never stored in barns or other valuable outbuildings," says Mr. Kephart. "If it should become mixed with dust on the floor it becomes a serious fire hazard. There is not much danger of fire when the dry crystals are spread on the fields if all dead vegetation and trash have previously been raked and burned.

"In studying the toxic effect of the chemical upon the soil, the Department scientists find that more chlorate is needed to kill weeds on fertile soil than on poor soil. For this reason farmers who plan to eradicate weeds from cultivated ground this fall or next spring should not fertilize the preceding crop. Furthermore, they may make heavier applications on the more fertile parts of the farm and lighter on the thinner portions. On highly fertile soils it may be better to use only cultural or cropping methods of weed eradication."

CRISP HEAD LETTUCE A COMING FLORIDA CROP!

In the Florida Grower for May, 1939, F. M. Connor, agricultural agent of the Seaboard Air Line, tells something of the possibilities of iceberg lettuce in Florida. As he uses the term, however, "iceberg" is not a varietal name but merely the current trade designation for the crisp head lettuce of the New York variety, and closely related strains.

"With the strong trade preference for iceberg, the South Atlantic and Northeastern States were handicapped because the available strains of iceberg would not develop satisfactorily under conditions prevailing in those areas," he writes. "Florida in 1925 shipped nearly 2,500 cars, principally of the leaf type, while her present production of all types is around 350 cars a year. The lettuce industry in the East was drying up, while the production of iceberg in the West increased yearly.

"Florida's agricultural leaders felt keenly the loss of this lettuce business and diligently sought to fill the gap. In 1930 the agricultural department of the SAL undertook to find a strain of iceberg that could be adapted to the soil and climatic conditions of the Southeast. Seed of many strains from all producing centers were obtained for test plantings. During one season 16 different strains were planted in locations affording varying climatic, soil and moisture conditions....none of these strains...were successful."

Yes, you've guessed it! They finally got around to trying one of the "old family doctor's prescriptions" for horticultural complaints--meaning that they discovered Ivan Jagger's Imperial No. 847 lettuce and planted out seed along with the other strains being tested. And No. 847 was the only one of the lot maturing firm heads and possessing the other commercial qualities desired. Growers, encouraged, increased their plantings of it and last fall in Manatee county there were between 300 and 400 acres of Imperial No. 847 grown.

"These plantings generally made splendid growth, from which carlots were shipped during the months of December, January, February and March," reports Mr. Connor. "Growers and operators of several packing houses (equipped with modern icing, grading, and packing facilities) coordinated their efforts to provide for the first commercial crop the type containers and methods of packing approved in the markets. Yields in some instances were as high as 600 small packed crates per acre. The growers, packers, the agricultural department of the SAL, and the publishers of Florida newspapers and magazines joined in an educational campaign that attracted national attention for Florida-grown iceberg. Prices were satisfactory; and the quality of this first commercial crop has won for future Southeastern iceberg a welcome in the markets of the country.

"In Manatee county alone it is contemplated there will be planted 1,000 acres of the Imperial No. 847 iceberg this fall...."

ADMINISTRATIVE NOTES

Travel We are informed that the Eastern Passenger Association, comprising railroads east of Chicago and St. Louis, and north of the Potomac and Ohio Rivers, including the Chesapeake & Ohio Railroad, has established a new system of reduced one-way and round-trip fares, effective June 30, 1939, based on distance zones and class of service.

Rates are divided into three classes--coach, lower berth and upper berth. Therefore where tickets are obtained for a certain class of travel (lower berth, for instance) and part of the trip is actually made in an upper berth or coach, a memorandum in triplicate must be prepared setting forth the dates of arrival and departure at points where the class of service was of a lower grade than that called for by the ticket, in order that adjustment may be made with the transportation company. Where possible this statement should be attached to the carbon copy of the transportation request; otherwise it should accompany the reimbursement account. Failure to supply this memorandum will result in the suspension from your account of the amount involved in fare or berth charges.

In this connection, attention is directed to the Memorandum of September 19, 1938, signed by Mr. Roney and addressed to employees in travel status, emphasizing the fact that unused railway tickets or portions thereof, purchased on transportation requests, should be sent in promptly to the Business Office with a memorandum

- (1) Submitted in triplicate;
- (2) Signed in duplicate; showing
- (3) Transportation request number;
- (4) Date and place of obtaining ticket;
- (5) Full description of actual class of transportation furnished;
- (6) Points between which travel was performed in Pullman, and points between which coach service was used, with dates and hours of arrival and departure of trains.

This information is necessary to enable the railroads to verify the types of service by checking with the daily records of their conductors. The Bureau Office of Accounts states that all of this information must be furnished to permit a prompt and accurate settlement of transportation requests on the basis of local fares for the different types of service furnished. Under no circumstances, of course, should an employee attempt to obtain a refund from a transportation company for an unused ticket or portion therefor obtained on a government transportation request.

ADMINISTRATIVE NOTES

Letter Writing "One of the most encouraging and notable developments in the field of public service during the past few years has been the increasing recognition by government agencies of the importance of letters in building good will and in helping to make the entire program of their agencies more effective," say James F. Grady and Milton Hall (Farm Credit Administration) in Public Opinion Quarterly (July) quoted by the Department's Daily Digest.

"In Federal, State, county, and municipal agencies, forward-looking officials are stressing the fact that letters are a major force in shaping citizens' attitudes toward their government. Since the citizen in dealing with his government seldom meets in personal interview with its agents, the letter becomes the Government's representative.

"While exact figures are not available, the number of letters mailed daily by Government agencies undoubtedly runs into millions. Of even greater significance in considering the effects of various forces upon the attitudes of the public is the fact that at least 90 percent of the contacts of government agencies with citizens are through letters. The effectiveness of the business of government, therefore, depends largely upon the effectiveness of its letters. And the taxpayer's impression of the quality of the service for which he is paying is determined by the kind of letters he receives...."

Telephone We are still having a little trouble with vouchers for long-distance telephone calls--meaning that you are going to have trouble also. Please check up on Par. 1674 of the Department Regulations and note that it provides:

"Employees making an administrative examination of accounts are instructed to suspend from vouchers any toll charge for a call unless Form AD-102, approved by a proper supervisory officer, is attached. Failure to furnish a properly executed form promptly shall be reported to the proper administrative officer."

This, of course, is in accordance with the recent ruling of the Comptroller. When you make such a call, fill out and certify Form AD-102 in triplicate, sending two copies along with the voucher and retaining the third copy for your files.

Vol. 11 No. 14

July 15, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY NEWS LETTER

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI

U. S. Horticultural Station, Beltsville, Md.
August 1, 1939.

No. 15

Tomato Breeding The News Letter for July 15, 1937, published an interesting note concerning tomato breeding work at the Beltsville, Md. Beltsville station, where we are testing hundreds--or is it thousands now?--of crosses and back crosses of Lycopersicon esculentum and L. pimpinellifolium in an effort to incorporate disease resistance with the desirable commercial characteristics of our best tomatoes. We have now large-fruited selections from backcrosses that possess practical immunity, though they are not quite ready for commercial tests.

New attention has been directed to this work by a recent paper in Science (June 30, 1939) in which G. W. Bohn and C. M. Tucker announce their belief that a strain of L. pimpinellifolium sent them by W. S. Porte of our Division is immune to Fusarium lycopersici; at least they have demonstrated its immunity to 39 strains from various regions of North America and other continents. Mr. Porte tells us that this strain is our No. 2116 (PEI No. 79532) obtained by the Division of Plant Exploration and Introduction from Dr. G. N. Wolcott (Estacion Experimental Agricola, Lima) who picked it up near Trujillo, Peru, in 1929. We received the material in 1930 and tested it on Fusarium wilt infected soil at Arlington, Va. for two seasons. In 1936 all selfed selections from the original accession grown in the Beltsville wilt test were 100 percent resistant to wilt, and all field, greenhouse and laboratory tests made each year since have indicated complete resistance to all the strains of F. lycopersici tested. Dr. F. L. Wellman has been able to recover the wilt pathogen from root tips of plants grown in soil heavily infested with the more virulent strains of the wilt organism, but these plants have shown no symptoms of wilting and the fungus has been found but rarely above the region of the cotyledonary plate. Even in such cases the organism did not extend very far into the main part of the stem, plants were not wilted, and normal crops of fruit were produced.

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Atherton C. Gossard (Nut fruit investigations)

"A trip was made to Harrison and Jackson counties in Mississippi and Mobile County, Alabama, the latter part of June to study pecan orchard conditions, particularly in relation to fertility and soil. A good many of the orchards in Harrison County have been improved strikingly in the past two years, and the growers are predicting a fairly good crop this fall. Some are speaking of the possibility of a hundred or more pounds per tree average over several acres. Such an improved condition was not found farther east in Mississippi and in Alabama. The cause seems to be largely one of fertility, and would appear to be brought about by a difference in the managerial set-up between the orchards in Harrison County and those in the counties farther east. A good many of the orchards in Harrison County are small owner-operated orchards. The owners operate, or concentrate on, a comparatively few acres, applying 30 to 40 pounds of complete balanced fertilizer per 15- to 20-year-old tree, in addition to planting and plowing in cover crops.

"In Jackson and Mobile counties, many of the orchards are parts of large coalitions operated by a single manager who spreads his operating funds over the whole acreage, and apparently does not do any of it much good. A striking demonstration of this condition was found in two adjacent Harrison county orchards. The owner operates his own 4-acre orchard and the adjoining 3-acre orchard identically with one exception. Both are 14 years old. Both have been given from 10, increasing to 20, pounds annually of 4-8-4 fertilizer per tree, for the past seven years. Both have had a cover crop of velvet beans plowed under annually. But the operator, who has two mules, has applied about 500 pounds of stable manure to each of his own trees annually for seven years. No manure has been applied in the orchard of the Chicago owner, who would have to buy it. The manured trees are several feet taller than the unmanured trees; the trunks of the manured trees have an average diameter of 2.6 inches more than the unmanured trees. The manured trees yielded 625 pounds of nuts per acre in 1937, 400 pounds per acre in 1938, and are estimated to be holding a crop of 750 pounds per acre for 1939. The unmanured trees bore 300 pounds per acre in 1937, nothing in 1938, and are estimated to have a crop of about 500 pounds per acre for 1939."

N. H. Loomis (Small fruit investigations)

"During the week ending July 8th the final spray was put on the peaches and grapes. Despite continuous rains there has been almost no brown rot on the peaches except where there was a break in the skin of the fruit. There has been a severe defoliation of some peach varieties apparently caused by 'black-spot or bacterial shot-hole.' Varietal susceptibility has been quite outstanding.....The first picking of Champion grapes was made this week. This variety is the earliest of all varieties under trial and is outstanding for its vigor. It does produce nice clusters of fruit, but it lacks quality."

NUT INVESTIGATIONS

George F. Potter, Bogalusa, La. (Tung investigations)

"An inspection of the nurseries on the Mississippi Cooperative Tung Farm, and on the lands of the Bogalusa Tung Oil, Inc., indicate that the seedling trees are finally breaking into a rapid growth. They seem almost to stand still for a long period after they break the ground. Growth measurements are being made both here and in the nursery at Lamont, Fla. to give more accurate information on the period of active growth.

"In the laboratory, Dr. McCann has examined some 2,000 microscopic slides of which 80 percent have been discarded. A median longitudinal section of the female flower is the best criterion of the stage of development but the inflorescence of the tung tree is such that it is impossible to predict where the female blossoms will occur or at what angle they may lie. To date no way has been found other than to cut, mount and stain a large number of sections from each bud. In the late stages it is possible to determine which sections are of value after the paraffin ribbon has been flattened on the slide, before mounting and staining. On the whole the histological study of flower development is an exceedingly tedious process."

He had written July 1: "Studies of the root system of a number of trees were made by Dr. Angelo. In a low area trees on which the lower roots had evidently been killed out by excess water, had formed many fibrous roots near the surface of the soil and seemed to be thriving. Many practical growers claim that the tap root of the tung tree is injured by transplanting and argue that the seed nuts should be planted directly in the field. Two 7-year-old trees, on similar well drained soil, one transplanted and one not, showed little or no difference in the character of the root system. Neither had a true tap root.

"The work of inoculation with various organisms that have been isolated was begun by Mr. Hines. Among diseases the root rot, clitochybe, now holds the lime light, having been especially virulent this season. Two beds of soil have been inoculated by burying portions of infected roots, one in a well drained area at some elevation and another in a poorly drained area at the bottom of the slope. Seed will be planted in these plots and also seedlings on which the root systems have been given different degrees of pruning."

C. L. Smith, Brownwood, Tex. (Pecans)

"During the week of June 19-24 pecan nuts were counted in the pollination plots. Unpollinated nuts of all varieties have dropped and, as usual, a heavy drop of pollinated nuts occurred during the period at which unpollinated nuts dropped. From these and previous data we believe a great portion of the 'June' drop is due to lack of fertilization and not to lack of pollination."

NUT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg.

"The forepart of the week ending July 8 was spent mostly in the field taking results of studies on spraying for the control of filbert blight. Excellent control of bud and twig blight was secured in spraying tests carried on in a 10-year-old Barcelona filbert orchard located near Albany, Oreg. by three applications of bordeaux mixture 4-2-50 plus Vatsol (4 oz. to 100) made in (1) the late summer of 1938 before the first fall rains occurred; (2) in the late fall of 1938 when the leaves were about half off the trees; and (3) in the early spring of 1939 when the leaf buds were breaking open. However, one spray application made in early fall gave almost as good control.

"The latter part of the week was spent in the Lebanon district checking on the results of spraying tests for the control of walnut blight. In tests carried on in that region, good control of the walnut bacteriosis was obtained by the application of two thorough and timely bordeaux mixture sprays. Copper oxalate also gave very good results. Thus in tests carried on in one Brooman Franquette orchard in this region two treatments of bordeaux mixture 4-1-100 plus a mineral oil, 1 pint to 100, applied in the early prebloom and late prebloom stages of development reduced the incidence of infection from 27.4 percent to 2.3 percent. Two applications of 19 percent copper oxalate 3-100 applied at the same time also gave very good control of blight under these conditions, reducing the incidence of infection from 27.4 percent to 4 percent.... A leaf spot disease of Persian walnuts due to Ascochyta juglandis, Bolt. is becoming quite prevalent in unsprayed Franquette orchards near Lebanon, Oreg. However, the lesions are not sufficiently abundant per infected leaf to cause defoliation."

He had written July 1 concerning a survey of diseases of walnuts prevalent in northern and central California. "Walnut bacteriosis was found to be present in only very limited amounts in northern and central California this year except in a few local areas in central California and along the coast. This situation is due to the abnormally small amount of precipitation which fell in this area during the critical period for infection. A limited amount of copper oxalate was used in the vicinity of San Jose, Calif. this season for the control of blight but results of these trials are not yet available. Brown leaf scorch of walnuts, a leaf spot that is very prevalent in Oregon this year, is present in only very limited amounts in Calif. It is practically absent in irrigated plantings. A small amount of this leaf spot was found in non-irrigated orchards near Santa Rosa, Calif. Walnut girdle or the black line disorder of grafted Persian walnuts is present in California as well as in Oregon. It is especially prevalent in Contra Costa county near Martinez. The Concord variety grafted on black walnut rootstocks is affected the most. The orchards affected range from 20 to 30 years of age. No pathogen has been found associated with this condition in California."

NUT INVESTIGATIONS

Alton H. Finch, Tucson, Arizona. (Pecans)

"Again this year, the data obtained suggest that an important cause of the 'May' drop has to do with insufficient chilling during the winter months," he writes July 1. "Trees sprayed with dinitro during January and February gave earlier foliation and it appears have had less drop although wide differences are not yet apparent.

"Considerable differences in extent to which varieties are affected by warm winter temperatures are apparent. Through the years, Halbert, Mahan and Humble have borne consistently well and have yielded as well on the southwest side of the tree as on the other portions. Western (Western Schley) and Onliwon have been affected to only a slight degree. Other varieties have consistently borne lightly on the southwest side of the tree and have borne irregular crops over the tree as a whole.

"During the 1938 season treatments to regulate vegetativeness of Humble and Mahan trees on the Yuma Farm were undertaken. Analyses of nuts collected serially through the period of filling has just been completed. Mahans reached a maximum of slightly more than 70 percent fat, Humbles just above 73 percent. Both were well filled and of satisfactory quality. The fact that Mahan nuts have generally filled well where conditions of moderate vegetativeness existed, that they have sold well (50 cents per pound) the past several years, and that they have borne regularly and heavily has caused considerable interest in them."

Milo N. Wood, Sacramento, Calif.

"The almond crop will be heavy this year," he writes July 1. "However, the lack of rainfall in some localities will probably result in almonds of rather poor quality and no doubt there will be a great deal of sticktight trouble in non-irrigated orchards. Almond trees are holding up somewhat better than I expected when I was over the ground a few weeks ago. Almond nuts are sizing up rapidly and appear to have sized up rather early, which of course under the weather conditions is an advantage."

DECIDUOUS FRUIT INVESTIGATIONS

G. A. Meckstroth, Willard, N. C.

"The blueberry season is nearing a close," he reported July 1. "Mrs. Crabbe made her last picking on June 30, but Mr. Huntington is still picking his late varieties, such as Concord and Rubel. I believe that Mr. Huntington is planning on making his last picking about July 11 or 12. The blueberry yields this year have fallen below the growers' expectation. This reduction in yield is due to a number of causes, principally frost injury, mite injury and hail."

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Wilcox, Pemberton, N. J.

"The seedling plantation has now been sprayed twice with bordeaux and appears to be in good condition," he writes from the Cranberry and Blueberry Disease Laboratory on July 15th. "Work on weed control is still in progress and the runners have not yet been tucked in on all of the older bogs, but this work is farther along than in any previous season. Many seedlings have set a good crop of the fruit. However, one peculiarity has impressed us, namely, the extensive length of the season of bloom of many of the seedlings. Some of the seedlings have varied to as large as marbles, with many flowers open. The majority of these seedlings have McFarlin as one parent. It is a characteristic of this variety, I believe, to bear fruit varying greatly in size, even on a single vine, at harvest time. It looks now as though many of these seedlings will have fully ripe and half ripe fruit present in October.

"The blueberry harvest has passed its peak. The early varieties are finished and the crop is diminishing on most of the midseason varieties. Nearly all growers have begun picking Rubel and Jersey has been started in a number of fields. In spite of the short crop the market is weak and prices are low. 'Mummy berries' have occurred quite generally throughout the blueberry area this year but the proportion of the total crop that has been infected in any field is very low. Most of these mummies have now ripened and either fallen to the ground or been picked from the bushes. A few growers have made a special picking of mummy berries in order to remove as many of them from the field as possible. Others have tried to keep them picked up from the ground. Certain unnamed seedlings have shown much more severe infection than many commercial varieties.

"During the early part of the harvest season of 1938, a few fields showed a fairly high proportion of soft berries, which we laid at the time to a combination of wet weather and the excessive use of nitrogenous fertilizers. The fertilizer formula for blueberries was changed by the station this year and there have not been any excessive rains during the picking season. It is interesting that there has been practically none of this type of soft fruit.

"The 'unknown' blueberry disease is showing up more conspicuously in the fields and we are finding new locations each week. During the present week we have identified the disease on a number of varieties on which it had not been noted before, including Rancocas, Jersey, Sam, Catherine, Adams and Stanley. We have not yet found the trouble on plants less than four years old. We visited a field on the 10th that showed the most general and most severe infection we have ever seen."

DECIDUOUS FRUIT INVESTIGATIONS

C. P. Harley, Wenatchee, Wash.

"The Wenatchee-Okanogan districts have just completed a successful cherry season," he reports July 12th. "Although the prices were not what they were in the palmy days, still they were as good as could be expected. Large sizes are again in demand, although the crop in general ran rather small. Ten-row Bings paid 7 cents a pound to the grower, 11-row, 5 cents, and 12-row, 3 cents. We had an interesting opportunity to study the effect of our thinning experiments to increase size of cherries. The commercial return showed our thinned trees to average 36 percent 10-row fruit, whereas the unthinned trees averaged only 14 percent 10-row. The trees on which these experiments were conducted were very vigorous and the unthinned trees ran larger than the average for the district. In the Van Valkenburg orchard where we also had a thinning experiment, our thinned trees produced salable fruit, whereas the unthinned were never picked. These trees had a tremendous set and were not any too vigorous.

"The estimate for the 1939 apple crop for the Wenatchee-Okanogan district is 13,920 cars. This is a good bit under the 1938 shipments, which totaled 16,233 cars. This reduction in crop is due to several factors including the removal of about 5,000 acres of apple trees during the past year. Also, a large number of trees failed to bloom this spring. With the trees gradually becoming less vigorous due to lack of fertilizer in many cases, they apparently were unable to come back with bloom following last year's heavy crop. I would say that there are more biennial bearing trees in the Wenatchee district than ever before in the history of the Wenatchee Valley. Approximately 1,500 of the 5,000 acres removed have been replanted. These replants are mostly soft fruits, cherries, apricots and peaches."

H. F. Bergman, East Wareham, Mass.

"A summation of temperatures in excess of 50°F. for May and June shows that it is quite possible that the berries of the 1939 crop may be of quite poor keeping quality," he writes from the Cranberry Disease Field Laboratory on July 8th. "The temperature summation this year is 600. Last year it was only 537, yet the crop was of poor keeping quality. More depends, however, upon the conditions of temperature and rainfall during July and August than upon the May and June temperatures. Last year there was a great deal of rain and high temperatures during July and August. This year so far it has been hot and humid but with very little rain.

"Cabot blueberries are just beginning to ripen. They should be far enough along in another week or ten days for picking to begin. The crop is heavy and the berries are of good size."

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunegan, Fayetteville, Ark.

"The week has been marked by high temperatures and continued clear weather," he reports for the week ending July 15th. "The entire countryside is beginning to show the effects of the dry weather. Fruit trees and other deep rooted vegetation are not suffering but the flower and vegetable gardens and lawns are taking on the dried-out appearance so characteristic of midsummer conditions here in Arkansas.

"The fourth cover spray was applied to our experimental apple plots in Ruppel's orchard on July 12 and 13. Apple blotch has become decidedly evident and for the first time in several years our experiment will yield results on the control of both scab and blotch. This spring I decided to double the size of the experiment by having duplicate plots using trees we have sprayed since 1936 and trees which Ruppel Brothers have sprayed only indifferently during the same period. The extra work and expense of this procedure is now clearly justified for there is very much more blotch in the plots previously sprayed by Ruppels than there is in our plots that have been properly sprayed for a number of years. The experiment promises, therefore, to yield information not only on the control obtained this year but also upon the accumulative effects of several years' spraying."

First Report of the Popcorn Disease of Mulberry in Arkansas.

On June 30th specimens of the popcorn disease of mulberry (Morus alba) caused by Sclerotinia carunculoides were received from Warren, Ark. The grower reported that the disease had rendered worthless, as food for hogs, the entire crop of 60 white mulberry trees in 1937, 1938 and 1939. While the disease has previously been reported from Leland, Miss. and Homer, Ruston and Shreveport, La., points between 76 and 124 miles southwest of Warren, it has not been observed in Arkansas.....

"Growers in the Springdale area report that they encountered severe competition with Illinois during the Yellow Transparent season. When the season started Springdale growers were receiving from \$2.00 to \$2.25 per bushel for this variety, but the heavy movement by truck from Illinois orchards forced the price down to 65 cents a bushel.

"A nurseryman at Rogers reported the loss of 2-year-old Jonathan, Yellow Transparent and Golden Delicious trees in the nursery rows. A visit to the nursery with Dr. H. R. Rosen revealed that the trouble was caused by fire blight. The nurseryman reported a loss of approximately 10 percent in a planting of 10,000 trees."

FIND NEW TREATMENT FOR NARCISSUS BULB PESTS

Under this title, the Department's Press Service distributed to the papers July 23, an interesting account of the vapor heat treatment.

"Insect pests of narcissus bulbs have been controlled for many years by hot-water treatments," it points out. "This method may now be superseded by a vapor heat treatment--developed by Randall Latta of the United States Department of Agriculture in cooperation with commercial growers of Oregon and Washington--in which moist, heated air under close control is circulated rapidly through a treating chamber. The margin between the heat necessary to kill the insects and that which injures the bulbs is narrow. A temperature of 110° to 111°F. has been determined as the most favorable to use in the Pacific Northwest. This treatment not only does not injure the bulbs but actually stimulates growth.

"The bulb farmer grows narcissus for increase, sorting out at harvest the bulbs of marketable size and quality and replanting the smaller ones. At least seven pests attack the narcissus bulbs--four flies, two mites and a nematode or ceworm. Except for the nematode, any of these pests can be killed without injuring flower quality the next season, by treating the bulbs for not more than 2 hours. An 8-hour treatment, likely to injure flower quality, is necessary to kill the nematode, and this treatment is not always successful. Growers do not expect to market bulbs treated for nematodes until after another growing season.

"Mr. Latta, in the Bureau of Entomology and Plant Quarantine, finds that the new treatment has many advantages over the hot-water treatment. Bulbs are easily handled in large quantities--as many as 20 tons at once. The risk of spreading disease infection through spores washed off in water is avoided. Drying is simplified, as it is necessary only to cut off heat and moisture and continue fan operation.

"The new treatment is a modification of the vapor heat treatments developed for sterilizing fruit when the Mediterranean fruit fly invaded Florida."

SPRAYING WILD FRUITS

Spraying the wild fruits and berries on which game animals and song birds feed, just as orchards and cotton-fields are sprayed to keep down insect pests and destructive fungi, is proposed by Floyd B. Chapman of the Ohio Division of Conservation, in a communication to the Journal of Wildlife Management. Test sprayings of two species of wild grape affected by the grape berry moth resulted in fivefold increases in yield of ripe fruit, Mr. Chapman reported. Spraying wild fruits has the further, indirect benefit of abating their role as lurking-places of insects and fungi that may spread to neighboring farms and orchards. (Science Service)

ADMINISTRATIVE NOTES

Long-Distance Telephone Calls "Under existing practices telephone calls are classed as local, interzone and long-distance," points out Office of Budget and Finance Circular 24, supplement 2. "In a decision dated June 17, 1939 (A-13067) the Comptroller General of the United States has ruled that interzone calls are not subject to the special certification requirement contained in the Interior Department Appropriation Act for 1940. This decision is in part as follows:

'Interzone messages can ordinarily be made by calling the same telephone operators who serve the metropolitan areas, while special operators must be utilized for long-distance calls beyond the established telephone zones. It is the view of this office that interzone messages are not to be classed as long distance toll messages with respect to the requirement as to special certification of telephone invoices. Local and interzone charges need not be specially certified.

'However, it appears that no inconvenience or confusion should be caused by the required certification of long-distance telephone charges, as it is believed there will be but few cases in which the telephone company's monthly invoices will not include long-distance tolls, for which the prescribed certificate must be furnished.'

This ruling supplements the instructions contained in Department Regulation No. 1674, and employees having copies of the Regulations should make an appropriate reference to it in their copy.

MAY R. JINKINS WINS CHAUTAUQUA SPELLING MATCH

Mrs. May R. Jenkins, secretary to Dr. John W. Roberts at the Beltsville station, spent part of her vacation at beautiful Chautauqua, N. Y. and proved that she has benefited from Dr. Roberts' painstaking supervision of her spelling by winning Chautauqua's Annual Prize Spelling Match. There were 45 contestants (37 women and 8 men) but the ranks thinned rapidly, especially when the reader began to give out proper names. Soon only three contestants were left standing. One of these got into difficulties with "deliriously," and then there were two! The first word to greet these survivors was "Weehawken," the name of a town just across the Hudson from New York City. It proved too much for contestant No. 44, but No. 45 (Mrs. Jenkins) found it easy--and gracefully accepted the ten dollars that had been set aside as first prize!

(This is published, of course, as an incentive for other secretaries to perfect their spelling!)

ADMINISTRATIVE NOTES

Automobiles The attention of employees operating automobiles for the Government should be called to an amendment to the District of Columbia Traffic Act to provide that operators of Federal Government-owned vehicles stationed outside of the District of Columbia shall not be required to have or obtain an operator's permit in the District while operating such vehicles within the limits of the District on transient or temporary official business of the Federal Government.

Prior to this amendment (since not even a Federal employee operating a Federal-owned motor vehicle on official business in the District was excepted from the requirement that no individual might lawfully operate a motor vehicle in the District without having first obtained a driver's license) the Police Court felt compelled to convict an operator of a Federally-owned vehicle for violations.

The amendment applies to the third sentence of the first paragraph of Department Regulation No. 1832 insofar as it relates to field employees while driving a departmental motor vehicle in the District of Columbia on transient or temporary official business. Employees maintaining copies of the Regulations should record this circular by an appropriate cross-reference notation in their Regulations.

Fire Risks With reference to the use of high volatile fluids for cleaning purposes, a memorandum from the Chief of the Office of Plant and Operation of the Department states:

"It is realized that in exceptional cases, the use of such fluids is necessary and prior approvals have been granted for their use because of the protective features which have been set up by the Bureau involved to insure against fire hazards. In cases of this kind, the use of ether, gasoline, benzol (benzene) or any other high volatile liquid for cleaning purposes will be allowed, but in cases where these protective features have not been approved or are not now in use, the use of the liquids noted above is prohibited.

"It is also desired to bring to the attention of the Bureaus the necessity for extreme caution in connection with the use of heating elements, etc. A fire recently occurred in the South Building which was caused by the heating elements being too close to the wooden surfaces. Prompt action on the part of the Guard Force precluded a serious situation. However, it is necessary that every care be exercised in situations of this kind to insure that all protective features surround the use of any piece of equipment which might cause fire."

Vol. 11 No. 15

August 1, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

SUBTROPICAL FRUIT INVESTIGATIONS

T. Ralph Robinson (continued)

planted in alternate rows. The soil in this tract is of the better grade of Norfolk sand, well drained but fertile enough to give fairly satisfactory growth with most standard citrus varieties budded on the sour orange rootstock.

"In digging these trees it was noted that the Cleopatra produced a deep tap root and an abundance of crown root with numerous fibrous roots--in this respect superior to the sour orange. Observations and records made of the growth during the eight year period show that in most cases the trees on the Cleopatra rootstock have from the start outgrown those on the sour orange rootstock, giving at the end of this period a largely increased bearing surface. A composite growth record of ten tangelo varieties gave an increase of 18 percent in height and 23 percent in spread in favor of the Cleopatra rootstock trees. Such a difference means approximately 40 percent increase in bearing surface. The trees on the two rootstocks came into bearing at the same time and the yields have been generally in favor of the trees on the Cleopatra because of the larger bearing surface.

"Quality tests of fruit samples from trees on the two stocks have shown no superiority (as sometimes claimed) for the slower growing sour orange rootstock as compared with the Cleopatra. These tests included comparisons as to the size and color of fruit, amount of peel, rag, and juice, percent of solids and acid together with taste and general excellence of fruit.

"This finding opens up the field for a more general utilization of the new high quality tangelos introduced a few years ago by the Division. With the rough lemon unsuited to use as a stock, the tangelos were (like the Temple orange) limited to culture on the hammock soils well suited to the sour orange rootstock. With the Cleopatra now demonstrated as well adapted as stock for tangelos and its known vigor even in much lighter soils than used in this test, tangelo planting for the fancy fruit specialist and as replacement plantings for unprofitable and lower quality varieties should receive some encouragement."

The tangelos were among the very first of our citrus hybrids to be selected for propagation and of all of the earlier hybrids they easily attracted the most attention, yielding a whole new series of orangelike fruits, many of them more beautifully colored than any orange and of exquisite flavor and aroma. For the purpose of horticultural classification tangelos are placed with the well-known types that they most resemble, most of them being designated as a group of new sweetoranges. The well known Temple orange, incidentally, is apparently a naturally occurring hybrid between the tangerine and grapefruit and hence actually a tangelo.

SUBTROPICAL FRUIT INVESTIGATIONS

C. L. Crawford, Indio, Calif. (U.S. Date Research Garden)

"In connection with the study of factors affecting 'checking' and 'blacknose' of Deglet Noor dates, an effort was made in 1938 to determine the period during which the growing fruits were susceptible to this injury from high humidity or rain. The technique was originated by Roy W. Nixon of this Station in 1930.

"In 1938, fruit removed at weekly intervals during the summer was submerged in water from 4 to 24 hours and the number of fruits showing new 'checkings' (small, transverse cracks in epidermis) noted. For fruit pollinated by Mosque the first 'checking' after 4 hours in water was observed on July 7, which was 13 weeks after pollination. At this time the fruit had reached approximately 1/3 of its maximum fresh weight. This immersion in water continued to cause 'checking' during the subsequent 7 weeks, the last injury of this kind being noted on August 25, when the fruit had attained maximum fresh weight and its color was changing from pink to light red.

"It was hoped that 1939 sampling might be started before any 'checking' was possible and the first samples were taken on June 7, about 11 to 11-1/2 weeks after pollination. However, samples from the Station showed about 7 percent 'checking' after 4 hours, 50 percent after 24 hours and 57 percent after 48 hours immersion in water. Fruits from the Cavanagh Ranch showed no 'checking' after 4 hours, approximately 22 percent after 24 hours and 33 percent after 48 hours.

"Root distribution of 10 Deglet Noor palms and 1 Halawy palm has been studied during the last year. With a soil tube, cores were taken in 1-foot increments, to a depth of 8 feet, with 4 holes in the center of two-foot squares extending from the trunk in a line at right angles to the tree row. These studies have been made on five types of soil ranging from Indio clay loam (silty phase) through Indio very fine sandy loam, Indio loam and Coachella very fine sand to a very gravelly sand or gravelly loam in an area not covered by the 1927 Soil Survey of the Coachella Valley.

"It is of interest to note that from 10 of the 11 palms thus far studied, the highest percentage of roots 3 mm. or less in diameter has been recovered from the third foot. Averages of the data from 10 Deglet Noor palms showed approximately 27 percent in the third foot, 65 percent in the top 4 feet and 87 percent in the top 6 feet. Horizontally, approximately 23 percent of all roots were found in the zone 2 to 4 feet from the center of the trunk and from 14.5 to 16 percent were found in each 2-foot space between 4 and 12 feet from the trunk. The last space, 12 to 14 feet from the palm, showed 15.5 percent or slightly more than some of the intervals closer to the palm, the relative increase possibly being due to the overlapping roots from the palm next to the one examined."

SUBTROPICAL FRUIT INVESTIGATIONS

J. R. Furr, Pomona, Calif.

"Observations made in many Valencia orange groves and extensive counts made in the irrigation plots in two widely separated Valencia groves indicates that next year's crop (fruit set this spring) will be relatively light," he writes July 20th. "While definite alternation is to be expected in the Valencia orange the 1938 and 1939 crops have both been relatively heavy and in many groves the 1939 crop (that being harvested now) is exceptionally heavy. It thus appears that in many groves the production of two relatively heavy crops in succession has exhausted reserves or brought about other changes that have resulted in more pronounced alternation than is usual in the Valencia orange.

"In one orchard of exceptionally high vigor, counts of old fruit and of blossoms on several hundred representative branches in June of this year showed that the average number of flowers per branch was almost exactly the same as the average number of old fruits. Usually about one percent of the flowers set fruits. Even if the percentage set is exceptionally heavy it is obvious that next year's harvest in this orchard will be very light.

"The number of green fruit carried by the trees in this orchard during the summer of 1938 (fruit set by 1938 flower and picked in 1939) was about 30 percent greater than that in the summer of 1937 and the growth rate of fruit in 1938 was about 20 or 25 percent less than in 1937. The growth rate of the trunks was also appreciably less in 1938 than in 1937. Although it is known that citrus in comparison with deciduous trees built up very small reserves of food materials, the above facts nevertheless suggest that exhaustion of food supplies or other substances necessary for growth affected flower production on these trees.

"In the interior valley regions nearly all of the lemon groves set a very heavy crop in the spring of 1938. With this exceptionally heavy crop of fruit the rate of growth of the fruit was low during the summer. In the fall of 1938 strong winds caused severe to moderate defoliation, depending on exposure. The result of the unusually heavy crop and partial defoliation was that a large part of the trees went through the winter with a heavy load of fruit which was below the size that can be marketed profitably, especially in a heavy crop year. In many instances trees were allowed to carry the smaller sizes until the fruit began to drop badly.

"Measurements made during the spring months some years ago showed that so-called tree ripe lemons continue to enlarge and presumably to use food materials until just before they are abscised. The situation just described resulted in marked reduction in apparent vigor of the trees this spring. Bloom in general was relatively light and the set of spring

SUBTROPICAL FRUIT INVESTIGATIONS

J. R. Furr (continued)

fruit has been light. However, with increased leaf surface from the spring flush of growth, it is very likely that the summer and fall sets of fruit will be relatively heavy. If this occurs, it will, of course, result in a better distribution of the harvests next year. Because of the very small number of fruits on the trees in the late spring and early summer and doubtless because of the apparently low vigor of the trees some growers have given their lemons a heavy pruning. It would seem that the selection of this spring for heavy pruning is particularly ill advised. Since the lemon crop is likely to be light and consequently prices relatively high it would have been to the grower's advantage to maintain as large a bearing surface as possible this season and to prune for renewal next year when it is likely that the crop will again be nearer to the normal size and prices probably lower."

METHYL BROMIDE NOW USED AS INSECT "EXTINGUISHER."

"Methyl bromide, sometimes used as a fire extinguisher, is proving even more useful as an insect 'extinguisher' or fumigant, as it will in many cases kill insects without injuring the plants upon which the insects are feeding," says a Press Release distributed July 16th.

"Entomologists of the United States Department of Agriculture are working with this fumigant to determine the time and temperature most effective for treatment to kill insects without injury to plants.

"Methyl bromide is used--in control of the Japanese beetle--in the fumigation of fruits and vegetables from within quarantined areas. It also has been found particularly useful for treating potted plants and nursery stock which may be infested with the larvae of this insect. After treatment the plants can be shipped outside the quarantined area without danger of spreading the pest. A few species of plants are injured by this treatment; others may be stimulated to more rapid growth.

"Methyl bromide is useful and economical in sterilizing soil, as 2-1/2 ounces of the gas costing about a dime will kill all the larvae of certain species of insects in a cubic yard of soil.

"Experience with sweetpotatoes infested with the sweetpotato weevil shows one of the peculiarities of the gas in its effect on living plants. When sweetpotatoes are treated direct from storage in the winter they may break down into watery, worthless masses. But if allowed to warm up gradually for a few days and then treated with gas at high temperatures the potatoes endure a fairly high concentration of gas, and when bedded to produce planting stock they yield more draws or sprouts for planting than the untreated roots."

DECIDUOUS FRUIT INVESTIGATIONS

John H. Weinberger, Fort Valley, Ga.

"The after-harvest application of nitrogen fertilizers was applied in the Elberta fertilizer experiment last week; and the entire Shalil crop at the laboratory of about a dozen peaches was harvested," he writes July 31. "Last year we had about 18,000 Shalil seeds. One seed of Red-leaf x Shalil matured, but if both the red-leaf and the nema-resistant characters are dominant, one seed from this cross may be sufficient.

"A canner from a nearby town is setting out 5,000 U.S.V. 11 this winter for canning purposes. He also liked the appearance of N.J. 71 while on a visit to the laboratory, and is planning on topworking a block of 5,000 Uneda trees to this variety as soon as possible. After obtaining permission from Prof. Blake, I gave him enough budwood for a start on the latter project."

"Only two seedlings of the 2,000 that were formerly in the test block remain to be sampled," he wrote July 24th. "One is an Iron Mountain cross and the other a (Dewey x St. John) x Veteran cross. Both are probably worthless. Incidentally the first and last seedlings to ripen in the block were both (Dewey x St. John) progeny."

On July 17th he reported: "Two hundred and eighty-four seedlings in the test block whose fruit was considered to have commercial possibilities were selected for further observation and the remainder of the trees with the exception of a few which have not fruited as yet were marked for removal. About 1200 trees were pulled last week and another 400 will be removed this week. The selected trees average 15 feet apart in the row, with rows 12 feet apart. This will allow ample room for more critical selection and testing in future years. Sixty-three seedlings were considered valuable enough to bud to nursery stock to insure preservation of the selection.

"During the week, yield records were taken in the Elberta fertilizer experiment, and three plots were mapped out in commercial orchards for comparison of the spread of the phony disease in weak and vigorous trees. Excellent contrasts in vigor of tree were obtained, using about 400 trees for each comparison. The size of the trees indicates that they have been in their respective growth status during their life, and from apparent fertility of the soil and size of the cover crop in the areas selected, will probably maintain the same status indefinitely."

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Wilcox, Pemberton, N. J.

"Blueberry bushes in many fields have been seriously hurt by dry weather; in a few fields many bushes have died, or been so injured that they may not recover for two or three years," he writes from the Cranberry and Blueberry Disease Laboratory on July 29th. "The most severe damage probably occurred to the Pioneer variety. In other fields there was no injury nor any serious lack of water. The dry weather tended to shorten the crop in most fields, and the harvest will soon come to a close. Jersey and Rubel varieties now furnish most of the fruit, but a few Concord berries are still on the vines.

"The blueberry disease upon which we have been working, which stunts the growth and reduces the crop, is becoming more apparent each week. In some places the foliage of affected bushes is taking on a red coloration, especially where the ground has been very dry. Most of our time during the week has been spent in a few blueberry fields, working on this disease. We have been taking notes and photographs, describing the appearance of the disease on different varieties, and trying to identify the early symptoms of this trouble. This is particularly difficult because of the slowness with which the disease apparently develops, and because these symptoms are complicated and obscured by the presence of drought injury or of damage resulting from the heavy rains of last year. The only way in which we can make sure of the earliest symptoms is to make a record of the appearance of individual bushes of different varieties in many fields and to follow these up with observations during the subsequent years. The combination of symptoms in advanced stages is easy to identify, but whether these same symptoms, when occurring separately, are a prelude to the disease, we are still somewhat uncertain.

"This is a rather quiet time so far as cranberries are concerned. Many reservoirs had been nearly empty, but have been replenished by the showers of the past week. At the seedling plantation, runners are being tucked in again on the older plants. The crop of fruit is much larger than that of last year and the berries are growing in size very fast. Around the edges of the plats, where berries rest on the damp soil, some rot has developed, but we have seen no rot whatever on fruit which is held away from the ground."

He had written July 22d: "The blueberry harvest is rapidly drawing to a close, hastened in most fields by the lack of rain. This has also reduced the size of most of the late berries. Rubel and Jersey are the only varieties now being picked in quantity. In spite of the short crop and small shipments, the price continues low."

NUT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg.

"The forepart of the week was spent in the Roseburg district checking on the results of spraying tests carried on in this region," he writes July 29th. "Good control of walnut blight was obtained in spraying tests carried on in this district by the timely application of bordeaux mixture and copper oxalate, respectively. Thus, in one Mayette walnut orchard located near Wilbur, Oreg. three applications of 3-100 copper oxalate compound containing 19 percent metallic copper applied in early prebloom, late prebloom, and early postbloom stages reduced the incidence of infection from 36.5 percent to 1.6 percent. In another test carried on in a Vrooman Franquette orchard in the same district, three applications of 19 percent copper oxalate 3-100 applied in the early prebloom, late prebloom and early postbloom stages reduced the incidence of infection from 12.5 to .08 percent. Bordeaux mixture 6-2-100 gave practically as good results under these conditions, reducing the incidence of infection to 0.19 percent.

"The latter part of the week was spent in the Stayton district checking on results of spraying tests carried on in that region. Excellent control of walnut blight from the application of a sufficient number of thorough and timely spray treatments was obtained in tests carried on in this district. Thus, in one test carried on in a Vrooman Franquette orchard near Sublimity, Oreg., three applications of bordeaux mixture 6-2-100 applied in the early prebloom, late prebloom and early postbloom stages reduced the incidence of infection from 47.8 to 0.9 percent. Copper oxalate, containing 19 percent metallic copper, at the rate of 3-100, yellow cuprous oxide 3-100 and copper acetate 3-100 also gave good control of blight under these conditions, reducing the incidence of infection to 2.9, 2.1 and 3.9 percent, respectively.

"The weather during the week has been characterized by abnormally high temperatures and low humidity. For the past seven days maximal temperatures of 90°F. or over have occurred at most points in Western Oregon. On Wednesday of this week a maximal temperature of 101°F. was recorded at Corvallis, Oreg. This is a very unusual situation in Western Oregon as such high temperatures over so long a time do not generally occur. The high temperatures have resulted in a yellowing and dropping of a number of walnut leaves in orchards located on marginal soil types. It is also causing suburn of walnuts in orchards where the foliage is under size or sparse. In some orchards visited during the week it is estimated that at least 2 percent of the nuts have already been injured by the heat."

Final results of field studies indicate that filbert buds are susceptible to infection by the filbert blight pathogen practically the entire year, as inoculations made at approximately monthly intervals from September 1, 1938 to July 1, 1939, were positive in at least some instances. The most critical period is apparently the interval from September 1 to December 1.

NUT INVESTIGATIONS

Geo. F. Potter, Bogalusa, La.

(Tung investigations)

"We are now having real summer weather with a great deal of rain," he writes July 22d. "At the tung farm precipitation for the week ending July 22 was 3.55 inches and in Bogalusa 3.35 inches. Heat and moisture are keeping the tung orchards that are on high well drained land, in a very vigorous state of growth. A part of the nursery at the tung farm is suffering from excess water and injury is apparent in a good many of the older orchards, in areas where previously the trees have done fairly well.

"Two more measurements have been made of those nursery trees from which we are endeavoring to determine the growth curve of the tung seedling. Like those in the nursery at Lloyd, Fla. our trees are now entering a period of very rapid development. In the budding nursery recent violent storms have caused considerable loss by blowing the trees over. Many of these have 15 or 20 buds and whenever possible we are working them onto seedlings in order to avoid losing them.

"In the laboratory some further studies are in progress on the variation in percentage husk, shell and kernel of fruits from 20 individual tung trees.

"In the histological laboratory Dr. Cook and Mr. Campbell have been trying to dissect out the embryo female flowers from the buds. It is yet uncertain whether or not this method will prove more feasible than the preparation of a large number of slides from sections of the entire growing point."

B. G. Sitton, Shreveport, La. (Pecans)

"A trip was made to Ferriday, Lake Providence, Collingston and Monroe to make a survey of the condition of the pecan trees in the orchards," he writes July 15th. "Trees in the thinned block in the Pecania Orchard at Ferriday had an estimated average of about 75 pounds of pecans while check trees in the unthinned orchard are practically devoid of pecans. Trees in both plots were sprayed in early spring for the control of Phylloxera and very effective control secured. Unsprayed trees outside the plots are badly damaged by this insect. The trees in the plot were also sprayed twice with bordeaux and the foliage is in good condition, with very little vein spot and downy spot."

F. N. Dodge, Robson, La.

"Wind damage is getting serious, that is if you consider that a loss of 1 percent of the trees in two weeks is serious," he writes July 15th. "Most, but not all of this, is due to weak crotches that could have been avoided. Some of it is due to the trees having too heavy foliage. No trees in the Bermuda plots or on the lawn have been damaged in any way."

ADMINISTRATIVE NOTES

Inspection of Plant Material In connection with the reissuance on March 31, 1939, of instructions relative to the inspection of plant material, Section 2 thereof, with reference to fungus cultures, has been revised by B. P. I. Memo. 1049, of July 20, 1939, as follows:

Importation of pathogenic material.--Requests for the importation of all pathogenic material, such as (1) virus infected specimens or their juice; (2) diseased plants or plant parts, including seeds, infected with bacterial, fungi or nematodes, or cultures, spores, or larvae of such pathogens; and (3) insects carrying plant disease agents, should be routed through the Business Office to the Chief of Bureau. The request shall give the identification of the material as accurately as possible, both host and disease, the source from which it is to be imported, the purpose of the importation, the place of maintenance after arrival, the length of time which the culture is to be maintained, and the precautions to be used in preventing its escape.

The request should be in duplicate, in order that the Business Office may keep a record of it. If approved by the Chief of Bureau the request will be transmitted to the Division of Plant Exploration and Introduction, which Division will arrange for the entry of the material and its delivery.

Subsequent transfer to other agencies in the United States or export of above material.--Before workers may transfer any of these materials out of the country or to workers in other Divisions or agencies within the United States, a similar memorandum, addressed to the Chief of the Bureau of Plant Industry, must be prepared by the responsible head of the Division or agency desiring the material and submitted through the Business Office. If approved by the Chief of Bureau, the request will be transmitted to the Division of Plant Exploration and Introduction, which Division will arrange for the transfer of the material.

Herbarium specimens.-- Herbarium specimens of any of the materials referred to above should be carefully guarded so as to preclude the possibility of dangerous diseases escaping from this source. Wherever feasible, such specimens should be treated so as to kill the causal agent, where this can be done without injuring the value of the specimens.

The Business Office will be glad to furnish further instructions and shipping-instruction cards upon request.

ADMINISTRATIVE NOTES

Tax Exemption Certificates. Recently one of the oil companies having a contract with the Government covering service station deliveries of gasoline and oil during the fiscal year 1940, requested one of our field station men to furnish in advance of purchase one Federal tax exemption certificate for the period from July 1 to December 31, 1939, and a second for the January 1 to June 30, 1940, period, both to be dated July 1, 1939. This was the first request of this nature to reach us, although it is known that some Departments have been following this practice, particularly the Navy in its contract No. 66906 with the Texas Company, covering lubricating oils July 1, 1939 to June 30, 1940. (Contract Bulletin June 13, 1939)

Following a presentation of the question to Bureau officials for determination we have been authorized to meet such requests when made by an oil company having a contract covering gasoline or lubricating oil purchases, either tank wagon or service station delivery. The forms 1094 may be furnished the dealer in advance, monthly, quarterly, or semi-annually as he may request, all to be dated July 1, 1939, signed by the purchaser in the usual way, the quantity to be left blank. In sending these to the dealer, however, it should be made plain to him that purchases are to be billed at the close of each month, regardless of how he may elect to handle the certificates.

Our understanding of the procedure followed by the contractor is that he will present the tax exemption form for clearance, supporting it with the signed purchase slips for the period covered, the quantity shown on the certificate agreeing with the total of the various purchase bills. The purchase bills also will show the United States Department of Agriculture number identifying the car serviced so that one certificate may cover more than one car.

Initialing Manuscripts It has long been the practice of the Department to require that all manuscripts offered for publication either in the Department series or in outside publications should be critically reviewed, and revised when necessary, by some one familiar with the writer's work. They should be read and initialed by the chief of the section also; or by some one designated to act for him.

Bureau administrative officers are now rather insistent that the initials of those who review manuscripts of any sort appear on the manuscript itself. Please make sure, then, that your initials appear on all of our manuscripts as well as those originating elsewhere, that may be referred to you for review. The initials should appear on the manuscript itself, not on the reference slip or accompanying letter.

ADMINISTRATIVE NOTES

Bids - In the preparation of bids in the field, where the present
Purchases supply of Form 33 is in use, the practice of attaching
sheets headed "Delays - Damages" and "Delays - Liquidated
Damages", with proper reference to same in the specifications will be
continued. When the latest revision of Form 33 is used, the foregoing
reference and attached sheets will not be required since these provisions
are covered in Condition No. 4 on the reverse side of the revised
form.

Special attention is, however, invited to the fact that in using
the revised Form 33, when Liquidated damages are provided for in the
invitation, bidders should be informed that condition No. 4 will not
apply. In such instances the use of attached sheets "Delays - Liquidated
Damages" will be continued.

The foregoing is brought to our attention in Purchase, Sales and
Traffic Circular No. 125-39, dated July 31, 1939.

Also, whenever equipment or supplies are purchased on bids prepared and opened in the field the responsible officer should see that a notice is posted on a bulletin board or other conspicuous place in the postoffice or other public building, briefly stating the nature of the purchase, place and date of opening the bid, and to whom to apply for the form on which to submit quotations. This should be done sufficiently in advance of the opening date to allow local people who may be interested an opportunity to submit a bid. When submitting a bid to Washington with recommendation for action it should be accompanied by a statement indicating the place or places where the notice was posted.

When bids are prepared at Headquarters for opening in the field, the copy sent to the field officer concerned will bear a brief reminder that he should post the required notice as indicated above.

The attention of all who have occasion to handle purchase vouchers is invited to the following choice of phraseology in the form of certificate required for vendors' invoices covering supplies furnished the Federal Government: "...furnished under purchase order No. _____" or "...furnished under this invoice." In Circular Letter No. 316, Supplement No. 1, dated July 21, 1939, the Procurement Division states that the Comptroller General has approved the use of either of the foregoing clauses.

WE MOVE TO BELTSVILLE!

With the finishing touches being given to the new Horticultural Building No. 3 on the grounds of the United States Horticultural Station, Beltsville, Md., Mr. Gould and the Washington personnel have moved in and are getting permanently settled in their new official headquarters. Thus Mr. Gould in the comparatively short time since taking charge of the work of the Division finds himself with a long-time dream of the research leader realized--that of having the clerical, administrative, fiscal and laboratory work of the organization located with the greenhouse and field experiments.

We now have three substantial and attractive buildings at Beltsville. Horticultural Buildings Nos. 1 and 3 face on the Baltimore-Washington boulevard, and Building No. 2 stands just back of No. 3. From these three buildings stretch the rows of greenhouses and the 700 acres of experimental orchards and fields. Mr. Fisher's section of handling, transportation, storage and market disease investigations will make its headquarters in Building 3 along with Mr. Gould, and we hope to have soon a description of the very modern equipment and general setup of Mr. Fisher's work at Beltsville.

Too, there are being erected on the station grounds a series of greenhouses to take over much of the greenhouse work of the Bureau formerly conducted on the Department's grounds in Washington. This is likely to add to the beautiful landscaping of the grounds of the station, and extensive additions to the flower displays. We may even have some of the national flower shows--Chrysanthemum, Dahlia, etc.--at the station! A number of wooded spots have been left almost untouched on the station grounds and in one of the most attractive of these is located the "Log Cabin" that serves as the center of the station's welfare and recreational activities.

The Beltsville station is about 15 miles from the Department, and three miles beyond the fast-growing University of Maryland and Maryland Agricultural Experiment Station. Two miles or so up the line is the U.S. National Agricultural Research Center, the "American Rothamsted." Make a note of this, because some confusion has already been occasioned by the mailing of important letters and packages to us at the Research Center.

Address all correspondence to the U. S. Horticultural Station, Beltsville, Md. Telegrams will continue to be addressed to Washington, D.C., and will be relayed to Beltsville by telephone. Freight or express shipments should be addressed: Mr. J. H. Beattie, Superintendent, U. S. Horticultural Station, Beltsville, Md. For _____

Vol. 11 No. 16

August 15, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI

U. S. Horticultural Station, Beltsville, Md. No. 17
September 1, 1939

Missouri Apples. Writing from the United States Fruit Disease Laboratory at Columbia, Mo. on August 15th, Dr. M. A. Smith says: "The sixtieth General Assembly passed a bill that provides for the labeling of all apples sold, offered or exposed for sale in Missouri, the label to give the grade, variety and minimum size.

"All apples exposed for sale in Missouri regardless of the State of origin, whether offered in retail or in wholesale lots, in bulk quantities or closed packages must in the future be labeled in accordance with this new law. The State Commissioner of Agriculture is instructed to establish standard grades for apples sold in the State. All apples that do not meet the requirements of the established or recognized standard graded must be labeled 'culls' in well proportioned letters, at least 2-1/2 inches high. An announcement has recently been made that the official Missouri grades will conform with the Standard U. S. Grades.

"The Missouri apple crop at the present time is considered quite satisfactory though it would not be termed a bumper crop," he adds. "Generally speaking, Missouri apple orchards promise a heavy crop of Johathan, Yellow Transparent, Oldenburg, ^Wealthy, Maiden Blush and Golden Delicious, a very light crop of York Imperial and Winesap; and a fairly light crop of Delicious. Other varieties such as Stayman Winesap, Black Twig, Ben Davis, Gano, Champion, King David and Grimes Golden promise a moderate crop--the yield varying considerably with various orchards."

DECIDUOUS FRUIT INVESTIGATIONS

H. F. Bergman, East Wareham, Mass.

Writing from the Cranberry Disease Laboratory on August 9th he says: "According to present indications the cranberry crop this year will be somewhat larger than that of last year, probably around 400,000 barrels. The yield is very spotty, different bogs and even different parts of the same bog vary greatly in yield which makes it more difficult to estimate the size of the crop. I saw one bog of Howes on which the crop would probably run from 75 to 100 barrels per acre, but this was exceptional.

"I also saw two bogs, one of Howes and one of Early Black, which a few years ago were very badly infected with false blossom, perhaps 60-75 percent of the vines being diseased. The bog of Howes was sanded, fertilized and dusted with pyrethrum for two years. The bog of Early Black was only sanded. The later bog now has a crop of 60-75 barrels per acre. The crop on the bog of Howes will probably be around 25-30 barrels per acre. They are both, however, excellent examples of the possibility of bringing back bogs that are badly run down with false blossom.

"Considerable variation is evident in the amount of 'mummy-berry' on blueberries this year although the amount of the disease this year is generally very small. Certain bushes, however, both of hybrid varieties and of wild ones have noticeable much greater proportion of mummy-berry than others, the amount being sufficient to make these bushes undesirable for culture. This is one aspect in the selection of new varieties from hybrid progeny to which perhaps sufficient attention has not been paid.

"The weather continues very dry and hot. In the Boston area July was the driest in the 121 years that the weather has been recorded. At Amherst it was the driest in 90 years. Except in the western part of the State there has not been enough rain in August to afford any material relief."

In connection with the lack of rain, he reports that on one of the A. D. Makepeace Company's bogs on which a Skinner overhead system of irrigation was installed several years ago, permitting the regular watering of the bog this year, the crop is very heavy, much exceeding that on the average bog.

Blueberry yield was good but the berries small on account of the very dry weather, selling at 35 to 40 cents a quart, with some bringing 50 cents a quart.

DECIDUOUS FRUIT INVESTIGATIONS

The out-of-town visitor was curious. "Why does that bell ring for a fire?" he asked. "It doesn't," responded the native promptly. "It rings for water; they already have a fire." These editorial thoughts come to us as a result of reading a report from Jess Kienholz. Dr. Magness has been visiting his experimental stations on the Pacific Coast--and we are wondering if he didn't think there was a fire!

"We had an enjoyable visit with Dr. Magness," writes Mr. Kienholz on July 31, "since he was present at Wenatchee, visited Hood River, and accompanied me to Medford. Temperatures reached only 108°F. at Medford during that week, whereas Canyon City, Oregon recorded 118°." But perhaps J. R. Didn't take Dr. Magness to Canyon City?

"It was my first trip to Medford," confesses J. R., "and really it was an education--not referring to the heat especially. How they grow orchards on some of their soil is beyond me. A very interesting but short visit was had with Professor Reimer and his experimental orchard was examined. Medford has a very good pear crop; in fact, one grower was seen thinning Anjou. Stony pit was found commonly on Bosc and a severe case of the disease was discovered on Anjou.

"I was very much interested in several statements made by Reimer. He has had stony pit under more or less critical observation since 1928. He claims that the disease has increased at Medford considerably since that time. It appears to me that possibly an insect vector may be at work in this spread. Mr. Childs has frequently commented on the fact that an occasional Anjou fruit near the end of a branch often shows typical stony pit; inferring perhaps that an insect fed at that point. In the Anjou, a mass inoculation may be necessary for widespread damage or the host may be able to mask the symptoms or eliminate the inoculum of a single point attack. The factors concerned in the masking effect on all varieties is extremely interesting but very complex. One of my Bosc bud inoculations into an Anjou produced extremely pitted fruit last year on the Bosc limb. This season the fruit is very near perfect in appearance. This, of course, is unusual, but does show the extreme variability possible from season to season. Another interesting observation made on Bosc is that a single limb of a tree may be severely affected by fruit pitting year after year, without spreading to the remaining limbs. However, when the affected limb is cut off, the disease frequently spreads to the remaining limbs in a short time.

"As I become more familiar with the trouble and have had the chance to observe the disease in the various fruit sections here, it impresses me that it is very serious. In fact, taking the fruit districts of the Pacific Northwest, I believe more damage is being done by stony pit than by fire-blight."

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Wilcox, Pemberton, N. J.

"In a previous report we mentioned the prolonged season of bloom on our cranberry seedlings," he writes from the Blueberry and Cranberry Disease Laboratory on August 12th. "Some individual seedlings showed blossoms for more than six weeks. We did not realize at the time that this condition was fairly general throughout New Jersey bogs, and will apparently result in a serious reduction of crop. Many bogs showed bloom as late as the first week in August, when the early-set berries were more than half grown. Much of the late bloom failed to set, or the berries have suspended growth; other late-set fruits will apparently make 'pic berries.' The condition is general on practically all bogs on which the winter flood was held as late as May 1st; in contrast, most bogs drawn April 1st or 15th have a crop approaching normal. Unofficial estimates of the New Jersey crop have now dropped to 80,000 barrels. Less field rot has appeared on the bogs than is usual at this season of the year.

"Our cranberry seedlings received their fourth spray of bordeaux on August 3rd and 4th. Since they include many late varieties, we will give them one more application, using a non-staining mixture. There is no defoliation and no rot has developed since our last report. The fruit is growing rapidly, but none of it has started to turn color. Some fruit worms appeared on the high side of the plantation, so we included arsenate of lead in our fourth spray. Tucking-in of runners is still in progress.

"The blueberry picking season is nearly over, though there will be some shipments of late fruit next week. The berries are mostly small and of indifferent quality."

Leslie Pierce, Vincennes, Ind.

"Harvesting of Elberta began the middle of August and the outlook is that the results of our spraying experiment on peach will not be very striking although there is some bacterial spot on the fruit of the check trees....The Dixie Orchard Company has a block of 400 Hale-haven peach trees that are making a good showing this season. The trees were planted in March 1936 and will produce at least 2-1/2 bushels of fruit per tree this season, of good size and highly colored. The first picking of the fruit was made August 4th.

"Bitter-rot has been increasing gradually in the apple orchards in the Vincennes area. The fruit on a block of Wealthy in the Dixie orchard is showing (August 5th) considerable rot. In addition to that variety I have found bitter-rot on Yellow Transparent, Grimes Golden, Rome Beauty and Jonathan. Mr. H. S. Holmes, Mitchell, Ind. has reported that bitter-rot is causing some damage on Jonathan, Grimes Golden and Rome Beauty in his orchard."

DECIDUOUS FRUIT INVESTIGATIONS

C. P. Harley, Wenatchee, Wash.

"The Bartlett pear harvest is now well under way," he writes August 18th. "This has been the most encouraging year for growers for some seasons past. Number one grade of pear has been bringing \$30 a ton to the grower. Some have attained almost what amounts to orchard run pears for \$24 a ton. In many orchards the so called 'pink end' or 'yellow end' of Bartlett is again showing up, and the cause of this remains as much a mystery as ever before. It will be recalled that last year we had a rather complete experiment under way, however, practically no 'yellow end' showed up in any of the fruits including the untreated plots."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga. (Pecans)

"On a day's trip into east central Georgia it was interesting to observe in the orchard of the Telfair Development Company the results of tree thinning operations. After only 1 year from thinning the remaining trees present a noticeably darker green leaf color and more vigorous growth than surrounding unthinned sections. In one part of the orchard the crotalaria cover crop was good but in an adjacent part where rye had been turned under just prior to seeding the crotalaria there was only a scattered stand of plants. While not for this reason but rather for the reason that some injury to the trees had been observed where there was a heavy stand of crotalaria the grower had come to the point of agreeing with us that he should not again attempt to grow summer cover crops. He had already made arrangements to obtain some 9,000 pounds of Austrian Winter Peas for fall seeding.

"During the month of July a total of 3.33 inches and during the first week of August 1.6 inches of rainfall was recorded at Philema. There has been no period during the present growing season when pecan trees have suffered for moisture although there has been so little in the surface, at times, that cover crops have suffered. Other sections of Georgia have not been quite so fortunate but, in general, rainfall has been adequate for optimum tree growth."

F. N. Dodge, Shreveport, La.

Writing from the Robson station on August 5th he says: "At this time it can be seen that the pecans on the trees in the cultivated irrigated plot are larger than those on the non-irrigated trees, and that the foliage has a darker green color. It is interesting to note these differences when Dr. Alben's soil moisture data show that except for the surface six inches of the soil moisture in the cultivated plots is above the wilting percentage. These differences are apparently resulting from the first irrigation, which was made six weeks ago."

NUT INVESTIGATIONS

P. W. Miller, Corvallis, Oreg.

"The forepart of the week ending August 5th was spent in the Newberg district checking on the results of spraying tests carried on in that region. Excellent control of walnut blight was obtained in spraying tests carried on in this district by the timely application of bordeaux mixture and copper oxalate respectively. Thus, in one Franquette walnut orchard located near Sherwood, Oreg., three applications of bordeaux mixture 6-2-100 applied in the early prebloom, the late prebloom and the early postbloom stages reduced the incidence of infection on the nuts from 18 to 0.5 percent. Copper oxalate compound containing 19 percent metallic copper at the rate of 4-100 gave almost as good results, reducing the incidence of diseased nuts to 1.3 percent.

"The latter part of the week was spent in the Gaston and Eugene districts checking on the results of spraying tests carried on in those regions. In both these districts good control of blight followed the applications of bordeaux mixture and copper oxalate. Copper oxychloride 3-100 also gave promising results.

"Results of studies on spraying for the control of filbert blight were also taken during the latter part of the week. Excellent control of bud and twig blight was secured in spraying tests carried on in a 15 year old Barcelona filbert orchard located near Scholls, Oreg. by two applications of bordeaux mixture 8-4-100 made in (1) the late summer of 1938 before the first fall rains occurred and (2) in the early spring of 1939 when the leaf buds were breaking open."

John R. Cole, Albany, Ga.

A storm struck the Taylor orchard August 11th and some damage occurred such as blowing off nuts, breakage of limbs on heavily loaded trees, etc. A rainfall of 1.18 inches was recorded. The newspapers report torrential downpours from tropical disturbance which on August 13th brought rainfalls of more than 4 inches in the Cairo area and inflicted extensive damage on pecan, peanut and cotton crops. Winds accompanying the heavy showers, says the report, swept a good part of the young pecans from the trees and materially reduced what had appeared would be the heaviest pecan crop in recent years.

"The shells of nuts are hardening now and it looks as if we will have another early harvest. Stuart shells have hardened so much that the shuckworm activities are confined to the shucks....Scab counts indicate that the best control is being obtained on plots sprayed with 3-3-50 bordeaux mixture, while commercial control is present on all sprayed plots. Most of the nuts from the check trees have dropped."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Geo. P. Hoffmann (Vegetable crop investigations)

"Examination was made of representative lots of tomato plants of deep and shallow setting, and very interesting differences were observed," he writes July 22nd. "Plant sizes used for this study were comparatively uniform, of the same age, and approximately 8, 12 and 18 inches above ground height and all had formed flower buds.

"Deep set plants were pruned to 2 to 3 leaves and set in a hole made with a post hold digger. Shallow set plants had not more than the 2 lower leaves removed and were set only slightly deeper than the plant stood in a 2-1/2 inch pot. Deep setting is apparently associated with an increased root system distributed over a longer zone and near-to-the-ground development of the first cluster of fruit-points favoring and disfavoring respectively such setting practice. The practice of a combination of deep setting and pine straw mulch appears to offer promising results in tomato growing on light and/or thirsty soils and during prolonged dry spells.

"Observations were made on 'mother roots' in the plant beds from which seedling sweetpotato plants had been drawn. Some of the numbers and selections have shown very interesting differences as to the number and quality of plants produced. Selections quick to sprout and giving good yields in plants likewise appear to be quick to grow off in the field.

"Sweetpotato plantings generally appear promising. Garden vegetables are scarce in this region. Late plantings of snap beans and lima beans have been in a large measure destroyed by the Mexican bean beetle"

N. H. Loomis (Small fruit investigations)

"The week was devoted entirely to general activities. Dr. Ragland from State College, Miss. spent 1 day at the station and was very much impressed with the muscadine-euvitis grape crosses from the Willard, N. C. station. The plants here are in their second year and a few have fruit, but the vigor of some of the hybrids indicates that even though entirely sterile they may offer an excellent rootstock for bunch grapes.

"A trip was made to Poplarville and Ellisville, Miss. early in July for the purpose of making blueberry selections from native plantings at these locations. Four selections were made at Poplarville and 28 at Ellisville, where the fruits seemed to be of much finer quality."

ADMINISTRATIVE NOTES

Liability Insurance The vital importance of automobile liability insurance has been emphasized from time to time in the News Letter, but never so strikingly as in a recent communication from Mr. Allanson to the Division of Cotton and Other Fiber Crops and Diseases, which we hasten to quote (without permission!) from its News Letter:

"Receipt is acknowledged of your memorandum of May 8, inquiring concerning the practice of the Bureau to require employees to carry insurance before permitting them to drive Government automobiles on public highways.

"Insofar as the Bureau of Plant Industry is concerned, it is mandatory that all operators of Government-owned automobiles carry insurance. Heads of Divisions have been instructed that employees in their Divisions be not permitted to operate Government-owned automobiles or automobiles rented for official use on public highways unless they carry liability protection for any personal injury and property damage they may cause. This has been the practice of the Bureau for the past 15 years. Your attention is called to various memoranda to Heads of Divisions issued from time to time by the Chief of Bureau, and particularly B.P.I. Memo. 851 of September 12, 1935.

"Anyone driving an automobile on the public highway owes it to the public to carry protection in case of accident. A good many years ago we had considerable experience with this problem. In one case, an injury to a child by one of our employees practically resulted in our moving out of the locality with our work. We cannot require an employee to get insurance, but we can and do require those administratively responsible to permit no employee without insurance to drive a truck on a public highway. When a new employee is hired, this requirement should be made entirely clear to him in case he is to drive an automobile, so that the wage he accepts takes into consideration any expenditures to which he will be put. I do not anticipate any change in the policy of the Bureau in this matter."

Plant Introduction After proving that we read the other fellow's News Letter, as evidenced by the quotation above, it is merely self-defense to show that our News Letter is read by outsiders, if we may stretch a point to call a good horticulturist like Ben Morrison an "outsider." He writes: "You may be surprised to know that the Semi-Monthly News Letter of your Division gets read so carefully as it does in our Division." Then he calls attention to the fact that in discussing tomato breeding work at Beltsville (August 1 issue) we refer to a plant as PEI (Plant Exploration and Introduction) No. 79532. All introductions are now listed as PI (Plant Introduction), initials that can stay indefinitely no matter how the name of the Division may change. So the tomato referred to is really PI 79532, a point I hope Bill Porte remembers!

ADMINISTRATIVE NOTES

Dr. M. C. Merrill, Chief of Publications for the Department, sends under date of August 1 a memorandum of Bureau editors regarding the marking, editing, arranging, and citing of illustrations and legends.

Marking Illustrations.--Ordinarily separate parts of a plate or figure should be marked with italic capital letters. The subparts should be designated by lower-case italic letters. These letters may be either *a*, *b*, *c*, etc., or they may be abbreviations or symbolic abbreviations of the names of tissues or parts concerned. In any case there should be no space between the letters nor periods following either the letters or the abbreviations. Illustrations of machinery, apparatus, or equipment may be published according to the rules of the Patent Office, in which case it may be necessary to designate the subparts by figures rather than by letters. This may also be done when the number of parts exceeds the number of letters in the alphabet. It may also be advisable in rare cases to use both figures and lower-case italic letters for subparts. The lines in a graph may be designated by either lower-case italic letters or the names as seems best.

Several separate objects shown in the same picture (as pots of plants) should be designated by capital italic letters unless there are two or more pictures on the same plate or text figure. Each picture should be designated by a capital italic letter and each subpart (a pot of plants in this instance) should be designated by a lower-case italic letter. Rows of plants or experimental plots should be labeled with lower-case italic letters.

Editing Legends.--Legends for illustrations should be set in 8-pt. roman lower case. In order that they may be edited uniformly, the following style is suggested:

Figures Legends of Two or More Parts Designated by Italic Letters

A. Without an introductory statement.

1. Designating letters should be followed by commas, the sublegends separated by semicolons, and each sublegend except the first, begun with a lower-case letter, thus:

Figure 3.--*A*, Cross section of alfalfa root; *B*, diseased alfalfa plants; *C*, leaves from healthy alfalfa plant.

2. If any sublegend consists of two or more sentences, each designating letter should be followed by a comma, and each sublegend should be followed by a period.

3. In some types of legends it is necessary to place the italic reference letters in parentheses to save space and avoid repetition, thus:

Figure 5.--Percentage base saturation (*A*) and pH value (*B*) of soils beneath three forest types.

B. With an introductory statement.

1. If the introductory statement is followed by a colon, designating letters should be followed by commas, the sublegends separated by semicolons, and each sublegend, except the first, begun with a lower-case letter, thus:

Figure 1.--Screen cages on poles: A, Cages of first type;
B, cages of second type; C, cages of third type.

2. If any sublegend consists of two or more sentences, the introductory statement should be followed by a period instead of a colon. Each designating letter should be followed by a comma, and each sublegend should be followed by a period.
3. When subparts of a part are referred to in a legend the introductory statement, if any, should be followed by a period, the legend after each capital designating letter by a colon, and the legend after each lower-case designating letter (except the last) by a semicolon, thus:

Figure 4.--Frame and fertilizer depositors. A, Frame with side-placement depositors attached: a, Pair of single-disk furrow openers; b, fertilizer-delivery tube; c, disk vertical adjustment. B, Depositor for mixing fertilizer: a, Shovel for depositing fertilizer in a band; b, special mixing shovel.

- C. Explanatory matter following a caption beneath an illustration will be centered (or set flush with hanging indentation) and will carry the final period.
- D. Occasionally or rarely it may be desirable to separate parts of a very long legend into paragraphs, corresponding to the parts of the illustration. In that case each paragraph should begin with the appropriate letter followed by a period and dash, and a period should be inserted after each paragraph.

Plate Legends.--The same general rules apply for plate legends as for figure legends. However, when a plate consists of several parts, and space permits, each sublegend may be set as a separate paragraph. A period and dash should then be used after each designating letter, for the sake of uniformity a period should be inserted after each paragraph.

Arranging and Citing Illustrations.--Whether the illustrations are plate or text figures, economy of space in placing or arranging the parts, particularly if they are numerous, should usually have greater weight than logical arrangement. In lettering the parts the strict alphabetical order makes for a better appearance, but it may not be desirable for the reason that the order of mention in the text and legend should properly follow the biological, chronological, or logical order. In such cases it is suggested that the lettering be done in harmony with the order in which the parts should be cited in the text and legend even though this results in what may appear to be a haphazard arrangement of the letters. Text and legend references will thus be in both logical and alphabetical order and there should be little difficulty in finding the labeled parts of the illustrations.

ADMINISTRATIVE NOTES

Renting Typewriters The Central Supply Section of the Department has negotiated contracts for the rental of typewriters during the period from July 7, 1939 to June 30, 1940, under the terms of which the contractor is required to deliver the machines to and remove them from the point of use, at his own expense. All machines furnished must be of modern design, with standard keyboard and elite type. They must be in first-class working order and the contractor is required to furnish such service and repairs as may be necessary to keep the typewriters in good working condition at all times.

The contracts cover L. C. Smith, Royal, Remington, Underwood and Woodstock. The first three are furnished at monthly rates of \$3.00, \$4.00 and \$6.00 for the 11-, 14- and 18-inch machines. Royal and Remington 26-inch machines rent at \$7.00 a month. The Underwood is furnished only in the 11-inch machine, at \$3.00 a month. The Woodstock charges are \$2.95, \$3.95 and \$4.95 for the 11-, 14- and 18-inch machines respectively.

Rental commitments will be made for periods not exceeding three months and shall be terminated upon expiration of any such rental period unless a supplementary commitment is made. The Government reserves the right to terminate rental at any time during the period covered and in the event the machines are retained for less than 1 month, charges will be computed on the basis of 30 days for each month. Rental charge will commence on the day following that on which each machine is delivered.

The use of these contracts in the rental of typewriters throughout the Continental United States by this Department is mandatory. As all requests for rentals must be placed through the Central Supply Section in Washington, those contemplating such rentals should send their requests to our Business Office in sufficient time to have the necessary orders drawn here, allowing at least 15 days in which to make delivery. And any adjustment or failure by the contractor to meet the requirements of the contract should be reported promptly to the Business Office.

Leave Employees whose appointments do not call for full time service and who are not paid full time salary rates must be considered as part-time employees, says the Comptroller General, and as such are not entitled to annual leave even though they work or are available for duty a greater amount of time during a year than a full-time employee (considering possible deductions for annual and sick leave for the latter); or that they may work the full percentage time for periods of 30 days or more.

Vol. 11 No. 17

September 1, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI

U. S. Horticultural Station, Beltsville, Md.
September 15, 1939.

No.18

If the apple
Hadn't dropped!

The late Sir Isaac Newton owed a good bit of his fame to his horticultural observations, a rather astonishing truth when one recalls that as a boy he was taken from school and put to work on the farm--only to display such a lack of interest in the job that he was promptly sent back to school! His outstanding achievement of course, and one that some authorities consider the greatest contribution of any single man, was the law of gravitation. That being the case, it is interesting to consider that if Frank E. Gardner, P. C. Marth and L. P. Batjer of our Division had been contemporaries of Sir Isaac the law of gravitation might yet be awaiting a discoverer. For Sir Isaac formed his law as a result of observing an apple fall from a tree--and our colleagues above mentioned have discovered how to stop apples from dropping!

That's entirely correct! In Science for September 1, 1931, they have a preliminary report that discusses spraying with plant growth substances to prevent apple fruit dropping, and announce that they have been able to stop the pre-harvest drops of apples, so troublesome and costly with early varieties and also with many important midseason and late sorts, merely by spraying the trees with dilute solutions of various so-called plant hormones. Here is an announcement that should prove very interesting reading to workers in the Division and elsewhere who have problems involving the premature abscission of fruits, flowers, seed pods, etc.

The preliminary announcement in Science is merely to call the attention of investigators to the possibility of using these plant hormone solutions in connection with problems involving the dropping of fruits or plant organs.

PRE-HARVEST APPLE DROPS PREVENTED BY SPRAYING WITH PLANT GROWTH SUBSTANCES.

"Most of the commercial so-called plant growth substances have the propensity, in varying degrees, of delaying the normal abscission of various plant organs," says this preliminary announcement in Science. "Among the number of these substances tested naphthalene acetic acid and naphthalene acetamide have been reported (by workers in our Division) as being particularly effective in delaying the abscission of flowers of the date and holly, in the latter case, resulting in parthenocarpy. The frequent observance of the effect of these compounds in delaying the abscission of floral structures, stems and also of petioles on treated cuttings led to the attempt to apply them in a practical way to the problem of apple fruit dropping by spraying the trees. The results to date have been more than gratifying.

"Thus far, trees of seven varieties, including Yellow Transparent, Williams Early Red, Oldenburg, Early McIntosh, Wealthy and three new early varieties, as yet unnamed, have been sprayed with various concentrations of the growth substances and a record obtained of the percentage of the total crop dropping from the trees over a period of time in comparison with the drop from untreated trees. Naphthalene acetic acid and naphthalene acetamide applied just prior to fruit maturity have proved to be particularly effective with all the varieties thus far treated. In addition to these two substances, indole acetic and indole butyric acids have been used, although the indications are that these indole compounds are much less effective in preventing abscission than either of the two naphthalene compounds.

"In the first experiments much stronger concentrations were used than are now proving to be necessary. Williams Early Red, as an outstanding example, was sprayed with .001 percentage of naphthalene acetic acid on July 13. By July 25 the unsprayed control trees had dropped from 64.2 to 90.8 percent of their total crop on actual fruit count. whereas the sprayed trees had dropped only from 1.3 to 1.5 percent of their fruit. Concentrations of .00025 percent on other varieties have since been found to bring about very marked inhibition of dropping. The effectiveness of some of these compounds in such dilute concentrations would definitely recommend their usage as a practical orchard procedure. Their practicability becomes enhanced if the present indications, that they can be added to the regular spray schedule, are borne out by additional experiments.

"It is anticipated that the detailed account of the experiments will be issued in the near future when the results are compiled on additional experiments, now underway, related to various practical phases of application."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

Writing from the U. S. Pecan Field Station and Laboratory on August 26th he says: "Chestnut harvest is well under way and the yield of nuts is fully up to expectations. Burrs are generally opening better than usual this year. Experimental treatments have been applied to samples of burrs from trees that show the poorest opening of the burrs under field conditions. The treatments have included several ethylene concentrations, drying, storing in closed containers, and normal field conditions. As yet there is no apparent beneficial effects on any of the treatments and the heavy concentrations of ethylene have apparently retarded opening.

"We are experiencing throughout much of this section, and especially in the Brown orchard at Philema, the heaviest infestation of walnut caterpillar ever observed. The infestation has become apparent only in the last week and the injury on some trees is very severe. A part of one day was spent at Philema studying the possibility of eradication by hand methods but it was found to be impractical and spraying will be required. This work will be started on the coming Monday."

He had written August 12th: "Crop prospects at the present time are very good at Philema with the seedling orchards giving promise of crops approaching the largest previously recorded. There was some loss in this section at the end of this week from the strong winds caused by the tropical disturbance passing through Alabama and Mississippi. In those States the reduction of crops due to wind damage will probably be heavy."

F. N. Dodge, Shreveport, La.

"The shells of Moore, Sabine and several other pecan varieties have completely hardened," he reports August 26th. "Schley, Success, and others are still only partially hardened. Major has almost completed its filling of the kernel."

He had written August 19th: "Our summer drought was broken this week by 1.60 inches of rain. This is the only important rain in six weeks, and the third of importance since April. Total rainfall since February has been 12.72 inches. Less than eight inches of this has fallen in sufficient amount to do crops any good. With this we have had thirteen days with maximum temperatures of 100° F. or more, and many days with relative humidity going down to 25 and 30 percent.... The hardening of the shells of the nuts is still in progress on all varieties except Major. With Schley and Moore it is about half completed. On Success, Pabst and Desirable it is just beginning. The crop of Major was harvested September 20 last year. It looks like that variety and all others will mature later this year than they did last year."

NUT INVESTIGATIONS

J. H. Painter, Cairo, Ga. (Tung investigations)

"An inspection of the girdling work at the Wight orchard seems to show that ringing by the removal of a strip of bark 1/8th of an inch wide, using no protective covering, is the most satisfactory method used so far. The next best method seems to be a double knife cut, allowing 1/8th of an inch between the cuts, with no protective covering. The other methods seem not to be severe enough to have any lasting effect upon the branches.

"Extremely quick callousing was effected by accidentally using a wax covering with a high percentage of beeswax. It has been suggested that a growth promoting substance may exist in the bees wax, that is responsible for the rapid healing in every case. The effect of the wax on the wounds was very striking in this test.

"In the leaf area work at Lamont, Fla. it was noticed that the limbs that were adjusted to 12 leaves to a fruit apparently caused such an accumulation of carbohydrates that the branches thickened above the girdle so much and the fruit and leaves increased in weight so that 2 out of 25 such limbs broke at the girdle. No limbs adjusted at a smaller leaf-fruit ration acted in this manner. Also it was noticed that the fruits have already dropped in a great number of cases of the high leaf-fruit ratio branches. Whether this is a moisture problem or just hastened maturity is not yet known.

"In the nursery at Lloyd, Fla. the application of zinc seems to have checked the 'bronzing'. It is felt that this attack of 'bronzing' may have affected the seedlings to the extent of checking their height and increasing the amount of crowning at rather low heights.....It appears that the point (height) at which a seedling will crown out is definitely associated with the genetic make up of the seed, and not just the height factor. Selection Alabama 12, for example, has a range of from 61 centimeters for the lowest to 121 for the highest and yet there is no crowning; whereas Selection Louisiana 14, having a very similar range of from 67 to 125 centimeters has 60 percent of them already crowned out.

Ernest Angelo, Bogalusa, La.

Writing from the U. S. Field Laboratory for Tung Investigations on August 19th he says: "Many of the budded tung trees are now nearly 12 feet above the ground and much breakage is taking place. It will be necessary to drive stakes as support for these trees in order to prevent an entire loss should there be a wind storm."

NUT INVESTIGATIONS

George F. Potter, Bogalusa, La.

(Tung investigations)

Writing from the U. S. Field Laboratory for Tung Investigations on August 12th he said: "The soil map of the west half of Section 10, which constitutes 320 of the 440 acres in the Cooperative Tung Farm, was worked over on the large scale of 1" to 264'. The stakes planted at the corners of each 10-acre block made it possible to map the drainage ways and the soil boundaries rather accurately even at this scale. This map has been scaled off with a planimeter and it is estimated that in the half section there are about 170 acres of land suitable for growing tung for experimental purposes. This is comprised chiefly of about 60 acres of Norfolk, 60 of Phoba and 35 of Bowie. Although this farm is shown on the 1918 soils map of the county as nearly solid Ruston, very little of the soil is today classed as Ruston by the Division of Soil Survey. What Ruston there is is located in the east half of the section. Clearing operations on this land, which included ridding it of a considerable number of roots and also a large number of stumps that were blown off just at the surface of the ground, will cost more than has been anticipated. An accurate account of the labor and materials used on an area of 13.75 acres shows an average cost of \$12.93 per acre to get it ready for the breaking plow. It is probable that this area has more stumps blown off at the surface than the rest of the farm....An increasing number of tung growers are calling at the laboratory and expressing considerable interest in the work now under way, and in particular in the nursery of budded trees...."

Milo N. Wood, Sacramento, Calif.

"At the request of growers, some field work was done upon almond orchard troubles," he writes for the week ending August 12th. "Dead branches appearing in the trees in some of the orchards apparently without any cause were finally found to be due to the effects of the shothole borer. These borers have attacked stone fruits in the past but so far as I know this is the first time they have been found to be of outstanding damage to the almond. The damage due to them this year seems to be more extensive than one would expect. The borers are worst upon trees that lack sufficient moisture or thriftiness. Growers have, therefore, been advised to do everything possible to keep up the vigor of the trees. Irrigation is of especial value in such cases. Growers have also been advised to cut off all the dead branches and burn them immediately to prevent the spread of the pest. "Some orchards are showing the effects of dry weather. It seems that in many cases estimates of the crop will have to be reduced 25 or 30 percent, owing to the small size of the nuts due to insufficient moisture. In a few orchards this size will reduce the estimate to as much as 40 or 50 percent. Even though this is the case many irrigated orchards are coming through with heavy crops and the average for the State will, no doubt, be heavy."

NUT INVESTIGATIONS

Howard E. Parson, Shreveport, La.

"Black aphids were counted on trees in various plots in the Webb orchard August 23d and 24th. The count was low on the check trees, the trees sprayed only early in the season, and on trees sprayed with bordeaux plus wettable sulphur all season, the maximum being 15 aphids per 1,000 leaflets. The count on trees sprayed with weak bordeaux all season went up to 57 aphids per 1,000 leaflets; for trees sprayed all season with strong high-lime bordeaux mixture the count was 86 to the 1,000; and 207 per thousand leaflets on trees sprayed with strong low-lime bordeaux mixture."

Elmer Snyder, Fresno, Calif.

"During August much time was spent checking over the fruit of the grape seedlings," he writes from the U. S. Horticultural Field Station. "The seedlings that had fruited in previous seasons were rechecked, especially those that appeared promising at their first fruiting. Many of the inferior seedlings were eliminated this season. This year many seedlings of 37 vinifera varieties fruited for the first time. In checking these selfed vinifera seedlings, the resemblance to the parent was found to be striking. In most cases the foliage indicated the parent variety. While the fruit was quite similar to the parent, variations were noted in color and season of maturity. Contrary to the general belief, these F₂ seedlings did not show a lack of vigor. Many seedlings from controlled crosses fruited for the first time this season. While this work has not been completed for the season (on August 26th) some promising seedless fruited seedlings have been selected for further tests. Ribier x Sultanina produced one promising seedless while several seedless types were produced by a Maraville de Malaga x Black Monokka cross."

"Grape Yield Records. --Grape yield records are being obtained from our various plots. Three days each week, grape pickers furnished by a local agency are harvesting our crop while we obtain our yield records and connected data. The Panariti and Black Monokka varieties were harvested during this week. The yield of these two varieties was greater than last season. The Black Monokka averaged for all rootstocks, yielded approximately 10 tons per acre. The Sultanina (Thompson Seedless) will be harvested the last week in August. Raisin varieties are now being placed on trays for drying. A trace of rain was recorded on August 19th and 23d. While there was sufficient rain to clear the air, no apparent injury was noted to ripening fruit or drying raisins."

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Wilcox, Pemberton, N. J.

"The weather was uniformly hot until yesterday, maximum temperatures varying only from 87° to 93° F., with average a fraction below 90°; minimum temperatures averaging 69°," he writes August 26th from the Cranberry and Blueberry Disease Laboratory. "The constantly high humidity made the heat oppressive. There was little precipitation except on the 19th when a torrential rainfall flooded cranberry bogs, washed out bridges and dams, and did widespread damage. The area of heavy rain coincided fairly closely with the cranberry growing area. The measurement at Pemberton was 5-3/4"; at Whitesbog, 8-1/4"; in the center of the area it reached a recorded maximum of 14.8" in 14 hours, which establishes a record for this locality.

"The number of broken cranberry dams reported has passed two dozen and is undoubtedly much higher; this considerably greater than the total number washed out in 1938. In the beginning of the storm, however, the ground was dry and the streams and reservoirs low, so that the flood subsided much more quickly than during the repeated rains of last year. Most cranberry bogs were under water for one, or in some cases two days. We doubt whether this will cause much damage to the crop now on the vines, although it will undoubtedly be partially blamed for the short crop.

"There was practically a full head of water on the cranberry seedling plantation on the 20th but the surface water was practically all gone the following morning. There is a good crop on a large proportion of the seedlings, with practically no rot showing at the present time. We intended to apply a non-staining spray to the plantation on the 22d, but a broken part on the machine interrupted the spraying when only about 400 plants had been covered. Despite the lateness of the season, we expect to complete this spraying early next week, since many of the varieties will not ripen their fruit until October. The fruit on more than a dozen of the seedlings has begun to turn color. The tucking in of runners on the seedlings has been completed for the season and very little more work remains to be done to put the plants in shape for the winter.

"There was a meeting of nearly one hundred cranberry growers at a bog near Greenbank on the 17th. From there we went immediately to Ocean County, where the second monthly demonstration of weed control was held. Several cranberry bogs were visited after this meeting. In the evening of the same day, a number of Ocean County growers met and completed organization of the Ocean County Cranberry Club."

- DECIDUOUS FRUIT INVESTIGATIONS

H. F. Bergman, East Wareham, Mass.

"Some observations have been made during the past week on salt injury on cranberry bogs that were flooded during the hurricane of September 21, 1938," he writes from the Cranberry Disease Field Laboratory on August 26th. "Some injury has shown up during the summer that was not apparent earlier.

"In the first place, the number of bogs flooded by salt water last September is very limited but some located near the seashore have been injured. There was one bog near Buzzard's Bay village where the water was on parts of the bog for a week or more and on this bog the vines over most of the bog were killed out to such an extent that the bog will have to be replanted. Samples of soil down to a depth of 6 inches were taken and analyzed for salt content. The upper 2 inches of soil had the highest salt content, about 0.2 percent of the weight of the air-dry soil. This diminished to 0.1 percent or less at a depth of 6 inches. The salt is retained to a considerable extent by the organic matter in the soil, which may account for its retention to the extent found after so long a period.

"Plantings made in May 1939 on several other bogs are nearly all doing very poorly but no analyses for salt content of the soil or vines of these bogs have been made as yet. Where the berries had not been picked when the bog was flooded, there was no injury to the vines even when the salt water stood on the bog for as long as 24 to 48 hours, but on vines that had been picked just a few days before the bog was flooded injury was often quite severe. Many of the vines in such places remained bare until the middle of July and then began sending out new shoots and are apparently going to recover. Vines picked several days before flooding show less injury than those where the berries were picked only two or three days before.

"Crop estimates range from 400,000 to 425,000 barrels for Massachusetts. A few are placing the estimate lower on account of the dry weather that we have had all summer, and which has retarded the development of the berries.

"Rot is showing up quite badly on some bogs and will apparently be about the same in amount as in 1937 and much less than last year."

----- ADMINISTRATIVE SPECIAL -----

Weight and Count of Mail Sent Under Frank. --The Division's quarterly consolidated report MUST be in the hands of the Chief of Bureau by October 15, 1939. Please mail your report for September promptly at the close of the month. If reports for July and August have not yet been sent in they should be included with the September report.

SUBTROPICAL FRUIT INVESTIGATIONS

Dewey Moore, Indio, Calif.

"Although I have been keeping weather records for a number of years, this season Dr. Aldrich and I have made a particular effort to determine the influence of large fluctuations in temperature and humidity upon leaf growth and fruit development of the date. To do this we have been measuring the rate of elongation of new leaves each day, in both a plot irrigated once a week and another plot without irrigation since the middle of May. Although the rate of leaf growth in the 'dry' plot was definitely slower than that in the 'wet' plot after June 10 the major fluctuations in rate have usually been the same in both plots. In the 'wet' plot the rate of leaf growth has varied from 2.6 to 4.6 centimeters per leaf per day. During the warm weather for the six day period from July 9 to July 14, inclusive, the daily maxima air temperatures varied from 112° to 119° F. During this six day period the leaf growth in the 'wet' plot was never greater than 3.4 centimeters per leaf per day and following the two days of 119° and 118° respectively, the leaf growth dropped to 2.6 centimeters per day. In most cases the rate of leaf growth was increased to 4 centimeters per day or more following each weekly irrigation, which in general agrees with our results for 1938. In some cases the rate of leaf growth seemed to increase during periods of relatively high humidity but this wasn't always true.

"During the periods of July 27 and 28 and August 1, 2, 3, 4, 5 and 6, the maximum humidity (at night) reached 70 to 89 percent. These maxima in relative humidity occurred just before sunrise. Several mornings I examined fruits between 5 and 8 a.m. in the Cavanagh date irrigation plots and observed fresh checking of fruit on the Deglet Noor variety.

"In an effort to find a practical means of improving the penetration of irrigation water (high in sodium) at the Martinez Research Station, we have tried a spring cover crop of Hubam clover (whose roots penetrated about 2 feet deep), gypsum at the rate of 5 tons per acre, sulphur at the rate of 1,650 pounds per acre, and double irrigation (a second irrigation a day following the first irrigation). It was apparent that following each irrigation the water in the basins disappeared more quickly where gypsum or sulphur had been applied than in the check plot. Soil moisture samples showed about the same amount of soil moisture before irrigation in the check, gypsum and sulphur plots; lower soil moisture in the Hubam clover plot and about 70 percent higher moisture in the double irrigation plot. Rate of leaf growth in the Hubam clover crop was less than in the check plot; and rate of leaf growth for the double irrigation plot was considerably higher than for the check plot. Leaf growth in the gypsum and sulphur plots was about the same as in the check plot, indicating that thus far the application of gypsum and sulphur have not improved the soil enough to cause increased growth of the date leaves."

SUBTROPICAL FRUIT INVESTIGATIONS

E. M. Savage, Orlando, Fla.

"Satisfactory progress has been made in the establishment of the new 80-acre U. S. Subtropical Fruit Research Station, 7 miles west of Orlando at the south end of Lake Hiawassa. The summer rains and sunshine brought out a good growth on the various plantings. Among the plantings made during the summer was a large collection of ornamental plants from the Plant Introduction Garden at Chapman Field and a collection of native palms from Lake County. Three varieties of date palms from Chapman Field were among the palms planted.

"From our own propagations some 500 young lychee and 1000 jaboticaba seedlings were grown in plant boxes and some set out in the nursery. Additional avocado and about 500 citrus trees were transplanted into the breeding and variety blocks; and 1600 pineapple slips set in blocks of 25 each for observation after various treatments for disease control by Mr. R. B. Piper. A sex classification has been made of the papaya plants in all three blocks, about 1200 plants, and breeding work started on them.

"Among visitors to the new station during the Summer months were Mr. H. P. Gould, principal horticulturist in charge of the Division; Dr. E. S. Ellison, in charge of the U. S. Weather Bureau Station at Lakeland, who came to arrange for extensive Weather Bureau equipment to be used here; and Dr. O. A. Bitancourt, from Brazil, who came to inspect the citrus disease experiments."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

N. H. Loomis (Small fruit investigations).

"The week ending August 19th was devoted to the harvesting of grapes. The varieties Concord, Extra and Lenoir were harvested from the rootstock block. Again the weaker Concord vines produced clusters having many green berries, while the vigorous vines were almost entirely free of this fault. Just as the Lenoir were full ripe we had a 3-day rain that caused considerable cracking of the fruit. Due to the type of cluster and the fermentation that started, the crop was a total loss; however, the yield records were obtained, the best vine yielding 74 pounds. Ordinarily this splitting and rotting after a rain is a characteristic trouble of Herbecmont in this section, but this year it was just enough later to escape injury."

He had written August 12th: "Of the approximately 50 grape varieties tested on their own roots, all but about ten are extremely weak or have already died out entirely. Consequently, walking along the rows gives a fairly accurate idea of which varieties are at all suitable to our conditions on their own roots..."

OLD FASHIONED MULCHING BOOSTS RASPBERRY YIELD

During the heat of a political campaign, an enthusiastic rally for workmen was held in a large convention hall. "Fellow citizens," roared the orator of the occasion, bringing his fist down with a bang on the table before him, "what, I ask you, is the present administration bringing this country to? And echo answers 'What?'" There was a movement in the back of the hall and a man arose. "Excuse me," he said, "but did I understand you to ask: 'What is the present administration bringing this country to?'" "Those were my words," said the orator. "And you say that echo answers 'What?'" "Yes," responded the orator. The man in the audience scratched his head and looked around him in perplexity. "Then there's something mighty funny about the acoustics of this hall," he said, finally.

What we mean is that when red raspberries out here at Beltsville yield 150 quarts from treated rows compared with 31 from checks, there's something mighty funny about it--but it's not the acoustics, we find, but a matter of old fashioned mulching. "Small fruits that should do well but do not often can be coated along with mulching, an old-fashioned but too seldom used treatment," says a release from our Press Service, describing some experiments conducted by George F. Darrow & Company at the Beltsville station. Dr. Darrow made several attempts to grow red raspberries at Beltsville with poor results. Four years ago an experiment was begun in which two 400-foot rows were mulched with rye straw at the rate of 8 tons to the acre. Two more 400-foot rows were given ordinary care and clean cultivation.

"Mr. Darrow reports striking results," says the item. "At the end of the third season the mulched raspberries had a 100-percent stand compared with 70 percent for the cultivated rows. The total cane or vine length of the mulched berries was four times as great as for the cultivated plot. The root system of the mulched berries also was four times that of the cultivated. The yield was 150 quarts of berries from the mulched rows compared with 31 quarts from the cultivated rows.

"A soil temperature record at 2 to 3 inches deep was kept on the two plots during 1938. The air temperature ranged from 9° to 102°. The soil temperature for the cultivated plot ranged from 21° to 101°. For the mulched rows, the soil temperature ranged only from 30° to 80°. Thus, the straw mulch served much as roof insulation in a house--keeping out hot air in the summer and holding in warm air in the winter.

"Organic material, such as cereal straw, tree leaves, sugarcane bagasse, waste from sorghum mills, and even sawdust, may be used as a mulch, says Mr. Darrow. Such outstanding differences in yield as those at the Beltsville station possibly won't be obtained in many instances where a mulch is used, he says, "but there is no doubt that a mulch helps the berry plants along."

Vol. 11 No. 18

September 15, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY NEWS LETTER

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI

U. S. Horticultural Station, Beltsville, Md.
October 1, 1939

No. 19

Market Diseases
of Fruits and
Vegetables.

The latest addition to our series of publications on the market diseases of fruits and vegetables is Miscellaneous Publication No. 340, "Market Diseases of Fruits and Vegetables: Grapes and Other Small Fruits," by Dean H. Rose, C. O. Bratley and W. T. Pentzer of Mr. Fisher's section of handling, transportation, storage and market disease investigations. The excellent color plates were prepared by L. C. C. Krieger, R. C. Steadman, Mary D. Arnold and J. Marion Shull, also of our Division. The popularity of these publications is evident from the fact that we have received as many as 106 requests in a single day for copies!

Because of the color plates and the resulting expense for printing them we could order only a small edition for free distribution and these copies are needed for market inspectors, county agents and certain other Federal and State workers who use them in connection with their official duties. It has not been practicable to make available free copies for the technical staff, nor for general State agricultural experiment station workers and vocational agriculture teachers. The Superintendent of Documents, Government Printing Office, Washington, D. C. supplies copies at approximately cost of printing and handling: Miscellaneous Publication 98, "Potatoes," at 30 cents a copy; MP 121, "Tomatoes, Peppers, Eggplants," 20c; MP 168, "Apples, Pears, Quinces," 40c; MP 228, "Peaches, Plums, Cherries and Other Stone Fruits," 20c; 292 "Crucifers and Cucurbits," 45c; and the latest, MP 340, "Grapes and Other Small Fruits," at 40 cents a copy. Orders should be sent to the Superintendent of Documents as the Department does not sell its publications. Remittance may be made by check or postal money order payable to him; or by coin, at sender's risk. The colored illustrations in the various bulletins are also issued in the form of posters, printed on cardboard, 7-1/4x12 inches, at 5 cents each.

NUT INVESTIGATIONS

B. G. Sitton, Shreveport, La.

"Many inquiries have been received during the past three weeks regarding the severe drop of pecans," he writes September 2d. "Some specimens of dropped pecans have been received. From 60 to 75 percent of these showed injury by shuck worm larva; most of the remainder had been off the tree so long that it was not possible to determine what was responsible for the drop....The trees in the cultural plots in the Fullilove orchard had a general infestation of black aphid, which were very much more numerous on those trees in the close spaced block. All of the trees were sprayed early in August. From the spray tower more pecans could be observed than from the ground, but the crop is very light. Many of the trees have little or no crop and the trees with the best crop probably do not have a prospect of more than 50 pounds. Earlier in the season there was a prospect of 100 or more pounds per tree. The reduction was caused by the nut casebearer and the shuck worm."

F. N. Dodge, Robson, La.

"Nut filling is progressing rapidly," he reports September 16. "On some varieties the nuts are almost completely filled, while others have some well filled nuts and some poorly filled. In general it looks as though nut filling will be very good this year. Most varieties have progressed from the shell hardening stage to almost complete filling in two weeks. It seems to me that shuckworm injury could hardly affect nut filling much in that short time since injury before shell hardening would cause the nut to fall. Nuts I have cut which had shuck worms are as well filled as any others. At present, there is no indication that irrigation has influenced the nut filling process."

He had written September 9th: "High winds this week completely broke one tree, broke out half of several others, and some large limbs in some more. With this there was also a loss of some nuts that would amount to more than five hundred pounds at harvest time....Soil moisture determinations made this week show that in the non-irrigated cultivated plot moisture is much below the wilting percentage down to 12 inches and that below this there is only 1 percent of available moisture. In the irrigated cultivated plot soil moisture is 3 to 8 percent above the wilting percentage toward the middle of the row and from right at the wilting percentage to 3 percent below the wilting percentage on the ridge of the tree rows where water could not be applied. This shows that the ground must be level for proper irrigating. It is interesting to see that the irrigation has increased the amount of moisture down to 5 feet. Irrigation this summer has maintained soil moisture at all depths at approximately what it was in May. Unirrigated plots have shown considerable decrease in soil moisture; possibly to the danger point....Nut filling is progressing rapidly with most varieties. The shucks on Major are beginning to open. Several varieties are completely filled and indicate good filling; others have ceased their filling and indicate the prospect of poor filling; still others have not begun their filling process."

NUT INVESTIGATIONS

Milo N. Wood, Sacramento, Calif.

"The Verticillium disease is spreading very rapidly in Field 6," he writes September 9th. "Among the trees lost are two outstanding spider resistant trees and at least five or six trees of promise. It is clear that we must discontinue Field 6 entirely and it is fortunate that arrangements have already been made to do so. The Verticillium disease seems to work faster this year than during previous years. Trees getting the disease will start wilting at the top and within a short time are entirely dead, looking much as if they had been roasted by a fire. I have noticed that when the young grafts get the disease they go very rapidly. Sometimes the older trees apparently recover from the disease but generally they eventually die. In obtaining the data from Field 6 it is noticeable that some of the older trees which have been there for several years are getting Verticillium for the first time. This, of course, is clear evidence that the disease is spreading through the soil rapidly. It seems probable that irrigation water aids in spreading the disease.

"We have had the usual crow menace in Field 6 but because of the large amount of almonds and the fact that there is a large number of tall trees surrounding those recently grafted they have not bothered the few nuts on the young grafts as much as I expected.

"I have made some examinations of commercial orchards for various reasons and I find that actually some of the heavy bearing non-irrigated orchards will not hold up to the estimated crops for the reason that the nuts are considerably undersized. However, some irrigated orchards on good soils are over-running previous estimates. The total almond crop will be very large.

"Recently we have had some very heavy winds and growers are reporting that they are having considerable trouble with the nuts now ready for harvesting falling on the ground on account of the winds before they get to them to harvest. This condition is especially bad in some of the windy sections where growers have started harvesting rather late. As it is expensive to pick up nuts which have dropped on the ground, the winds have resulted in some additional expense from the harvesting viewpoint in some orchards."

He had written August 26th: "Almond trees in non-irrigated districts are suffering from lack of moisture but they are coming through better than one would expect. On the whole the almond crop will be very heavy but owing to deficiency of soil moisture they will not as a rule size up normally in non-irrigated orchards. It is, therefore, probable that previous estimates of the crop in such orchards will have to be reduced to 70 or 80 percent of the original estimates, and in some cases even more."

NUT INVESTIGATIONS

Felix S. Lagasse and Harold M. Sell, Gainesville, Fla. (Tung Investgs.)

"Since our last report construction work on the new laboratory building has progressed to the point where we have been able to move in," they report August 25th. "Accordingly we would like to advise that our new address is: University of Florida Campus, P. O. Box 2817, University Station, Gainesville, Fla.

"The field work with tung trees concerning circumference and terminal growth is continuing. Even though the rainfall to date is several inches above average evidence of the serious injury from frost damage last February is continuing to appear, particularly in the Bennett orchard which seemed to be especially hard hit. Hundreds of trees are completely dead and are being removed. In other instances the complete exterior of the tree to a depth of a foot is dead, only the interior of the tree carrying any foliage.

"Still another stage of injury is indicated by a rolling of the leaves and a very diminished leaf area due to small leaf size. Upon examination of the branches of trees in this latter group, injury to the conducting tissues was evidenced by browning in some but not all instances. It has also been observed that many tung trees which bore a very heavy crop last year were more severely injured than adjacent trees bearing lighter crops, a fact previously observed with other fruits.

"There is very little new planting going on in the immediate vicinity of Gainesville, the largest, and it is two years old, being that of the American Tung Oil Company, known as the Larah planting, 2,000 acres, located about three miles from Brooker. Due to the fact that Crotalaria spectabilis caused a loss last year through poisoning of 60 head of purebred Angus cattle, 4 mules and a goat, they are using Crotalaria striata instead over much of the acreage. Some new plantings are being made to the southwest of Gainesville on lighter soils, although most of these are of a promotional nature. Crotalaria spectabilis and Alyse clover are being used as cover crops in these young plants of about one thousand acres."

Max B. Hardy, Albany, Ga.

"The chestnut harvest appears to be about two-thirds over and to date about 600 pounds of nuts have been harvested," he writes September 2. "One tree, No. 7270, has already yielded over 100 pounds and at least one other tree should do as well. In general, burrs are opening better than normal this year and harvesting has not been quite the task it usually is. Some work on the treatment of burrs, pulled green off the trees, with ethylene and other treatments has been continued but in no case have the treated burrs opened as well as those ripening on the trees and dropping naturally."

NUT INVESTIGATIONS

George F. Potter, Bogalusa, La. (Tung Investigations)

"During the week ending September 2d Dr. Crane visited the station and reviewed our accomplishments to date."

"In the laboratory progress on histological investigation of gruit bud formation has been considerably slower than we had hoped, due in large measure to the nature of the inflorescence of the tung tree. Our pathologist, Mr. Hines, was able to show Dr. Crane an interesting pathology planting on the farm at Cross Roads, Miss., where experiments with root rot and other diseases are in progress.

"In the field the principal points of interest were the 40-acre nutrient plot at Pine Grove, La.; soil plots located in various orchards in Louisiana and Mississippi; two nurseries where individual seedling progenies of our 300 selected parents are now showing some rather distinct characteristics; the budding nursery, where there are some 1500 trees belonging to about 50 different clones, and the tung farm where there has been considerable progress in erecting buildings and in getting the land ready for planting this coming winter...

"During this week work was completed on a test of the accuracy of a 'tube' method for studying root systems of tung trees. With this method a 'core' of soil is extracted by driving a Viehmeyer soil tube through the area to be investigated and determining the weight of the roots 2 mm in diameter or smaller which is included. The average weight of roots in a cubic foot of soil 3 feet from the trunk of each of 25 7-year-old trees was determined, first by the 'tube' method and then by digging up the complete cubic foot and finding the exact amount of roots present. The tube used has a diameter of 55/64ths of an inch and the volume of a core 12" in length is 6.96 cubic inches, or .004028 cubic feet. This is a relatively small fraction and in any single cubic foot the error of estimate would be rather high. However, a statistical analysis of the data indicate that if one such core is taken from each of 100 cubic feet of soil, the total quantity of roots may be estimated with a standard error of not over 5 percent.

"In 25 cubic feet of soil studied the total quantity of fine feeding roots was 856 grams. Estimating this quantity on the basis of 100 soil tube samples, we obtained 891 grams, a difference of 35 grams or an error of about 4 percent. This indicates that the method is of very great value since the average root concentration at any particular distance from 100 trees can be estimated with reasonable accuracy, with comparatively little labor and without harm to the trees."

NUT INVESTIGATIONS

Alton H. Finch, Tucson, Ariz.

"During the last few weeks there have been heavy rains throughout Arizona," he writes September 14th. "It is probable that considerable damage has been done to the date crop. The effect it will have on the filling and maturity of pecan nuts remains to be seen but on the soft alluvial soils of the Yuma Valley it has been generally observed that a heavy rain at this season is followed by an intense greening of the trees and filling does not progress so satisfactorily... Analyses of pecan nuts collected through the 1938 harvest season have now been completed. The heavily fertilized and frequently irrigated plots have again given the poorest filled nuts. Shading has been the most important single factor in reduction of filling."

SUBTROPICAL FRUIT INVESTIGATIONS

Roy W. Nixon, Indio, Calif.

"This year for the first time a study is being made of the leaf-fruit ration in date palms," he writes from the U. S. Date Research Garden on September 9th.

"The need for experimental data bearing on this problem has been felt for a long time and has been particularly acute for the past two years. The freeze of January 1937 resulted in more or less defoliation of all date palms in the Coachella Valley. Since then flowering and consequent yields have been very erratic due to the lack of proper adjustment between amount of fruit and number of leaves. As the leaves of a date palm normally remain green for 3 to 5 years, a study of the leaf-fruit ration in dates must take account of the age of the leaves, so the experiment was planned to compare the efficiency of 1937 with 1938 leaves. Growers usually leave from 3 to 4 years' growth of leaves on the palms, but because of the freeze mentioned above no normal leaves prior to 1937 have been available.

A comparison is being made of the effects of 3, 6, 7-1/2, 10 and 15 leaves per bunch upon fruit size and quality, and upon palm growth. The fruit was first thinned to a uniform number of date per bunch. Then the 1937 leaves were removed from one group of the palms, and the 1938 leaves from another group, at the same time reducing the number of bunches to the desired ratio. Samples of dates collected in the 'khalal' (pre-ripe) stage show that for the same leaf-fruit ratio the 1938 leaves have produced greater fresh weight per fruit than the 1937 leaves. Increasing from 3 to 6 leaves per bunch increased the fresh weight of fruit (on August 22) from 6 to 11 percent. Further increase in number of leaves per bunch has shown very little increase in fruit size. Yield and grade records will be kept during the harvest, which will begin in about a week. A low leaf-fruit ration has very definitely depressed leaf growth as measured by the elongation of bud leaves. Immediately following pruning, leaf growth in most instances was greater with the 1937 leaves retained, but this difference has not continued. During the past four weeks, the rate of bud leaf growth for three leaves per bunch has been somewhat less for palms with 1937 leaves per bunch this difference did not occur."

DECIDUOUS FRUIT INVESTIGATIONS

J. R. Kienholz. Hood River, Oreg.

Reporting for the month of August he says that the first picking of Bartlett pears was begun in the Lower Valley August 10, in general a week to ten days earlier than in 1938. Bartlett in the Upper Valley were being picked August 23. "Growers are somewhat more optimistic about fruit prices this season," he writes. "Several sold Bartletts for \$25, orchard run, or \$30 for No. 1's. Buyers have been offering \$1.10 to \$1.15 for Anjou, the harvest of which begins about August 1.

"Stony Pit of Pears....A careful examination of the Babson orchard at Parkdale has been made. The sixth crop of Bartletts topworked to old diseased Bosc trees is again clean. An interesting feature of this block is that old trees were completely budded; that is, some 200 to 250 buds were inserted on each tree. The trees are now filling out well and are producing a good tonnage. From similar work in this orchard, it appears probable that Comice fruit will show a similar tolerance toward the virus. Where diseased Bosc buds have been inserted previously to healthy Bartlett trees at the station all fruit is still sound....

"Cherry Troubles. The Dalles orchards as a district really look 'tough.' Many blocks of cherry trees are nearly defoliated. This is the result of an extended drought primarily, with red spiders and soil fungi contributing to the decline. Soil moisture is running about 8 percent in the third foot, while wilting percentage is around 10 percent. Where water has been applied in this late stage, trees are again foliating and blooming the second time. If a severe winter occurs, it is my guess that half the orchards in the district will be killed...An examination of some of the dying trees showed crown infections by Armillaria mellea. These trees were mostly of the Elton Abundance variety of cherry, a local seedling.

"Armillaria root rot. A call to examine an apple orchard revealed an interesting situation. Seven rows of Spitzenburg trees planted among an orchard consisting of Yellow Newtown, Ortley, and Delicious trees, were dying. In each case the shoestrings and fan-shaped growth of Armillaria were abundant at the crown and the fungus had girdled the trees. None of the other varieties was affected. The trees were about 30 years old. It is possible that the graft unions may have been just incompatible enough to allow a point of entry in many cases. Profuse "bleeding" occurred on the scaffold limbs, due to sap pressure; the sap being unable to pass the girdled portion."

R. B. Allyn, Medford, Oreg. (Duty of Water Investigations)

"A study is now in progress in the laboratory on irrigation water penetration in local heavy soils. Marked increased permeability to a solution of $\text{Ca}(\text{OH})_2$ as against distilled water has been noted. The effect of moisture content on soil consolidation is also being studied in its relation to water penetration."

DECIDUOUS FRUIT INVESTIGATIONS

Elmer Snyder, Fresno, Calif.

"Grape harvesting is in progress at the Fresno station; yield records of varieties harvested to date indicate somewhat higher production than in 1938," he reports September 9th. "The Sultanina (Thompson Seedless) was harvested on all rootstocks during the past two weeks. The production averaged for all rootstocks was 14.25 tons per acre. The sugar refractometer readings averaged 19.9 with an acidity reading (computed as Tartaric acid) of .58 grams per 100 cc. This stage of maturity was reached 15 weeks after the blossoming period with an average mean shade temperature reading of 78.8°F.

"In the rootstock plot, additional fruiting wood was left on the more vigorous rootstocks last pruning season. Increased yields were obtained where more fruiting wood was left without apparently weakening the vines, indicating that the more vigorous vines were undoubtedly over-pruned in previous years. Sultanina grafted on Solonis x Othello No. 1613 rootstock averaged 15.8 tons per acre.

"During the harvesting season, a considerable number of growers visited the vineyard; some interested in our new seedlings and introduced varieties and others wishing to see the production and quality of the standard commercial varieties when grafted on rootstocks. In addition to local growers, during the past week we had agricultural officials from Tel-Aviv, Palestine; Larnace, Cyprus; Houston, Tex.; Sacramento, Calif.; and local agricultural school leaders."

Claron O. Hesse, Davis, Calif.

"The almond crosses, designed to throw some light on the inheritance of the bitter vs. sweet character in the Prunus sp. were tested for bitterness and cultured, although not all the crosses have been so treated yet," he writes August 28th. "The method is to take part of the pit for the bitter test, using picric acid, - sodium carbonate strips, and culturing the rest of the pit. We do not know yet how this is going to work, but it looks practical. This will enable us to test the statement sometimes made that bitter pollen will cause the pits of sweet varieties to be slightly bitter or, in other words, exhibit xenia; and to use the same material in the genetic studies. So far this (xenia) has not appeared to be the case.

"Two rather surprising facts have been brought out by this chemical test: First, that there is a certain amount of variability within a variety, not all of which can be logically accounted for as variation in the test used. Second, some varieties which appear to be entirely sweet to the taste show a definite bitter reaction, though slight. This latter circumstance is especially enlightening in explaining the conflicting evidence derived from crosses made in the past."

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Wilcox, Pemberton, N. J.

"The commercial cranberry harvest in New Jersey started during the first week of September and is now under way on all bogs," he writes September 16th. "Berries were not very well colored on September 1, but the Blacks have now taken on good color. A few more cool nights or light frosts will deepen the color on other varieties. At the time of the freshet on August 19, there was considerable anxiety among cranberry growers as to whether a flood on the bogs at that time would induce a large amount of rotten fruit. The answer is now becoming apparant. On sound bogs and those that had received a thorough spray program throughout the season, little rot has developed. On the other hand, where the berries in previous seasons had shown any tendency toward rot and where the spray program was lacking or was not applied at the critical times, large amounts of rot have appeared in the field. In a few places this field rot is very close to 100 percent. The entire growing season up to August 19th had been favorable for the control of fungi, and it is probable that if the flood had not occurred, most of the fruit would have been harvested in apparently sound condition...."

"Mr. Bain arrived on September 11 to pick the early-ripening fruit from the seedling plantation. He returned to Washington on the 14th with 80 samples. It is evident that the great majority of the seedlings will rank as mid-season or late varieties. It is rather remarkable that of more than 800 crosses involving the Early Black as one parent, not a single seedling exceeded the Early Black in earliness and not more than 1 percent even approached it. The early seedlings picked included very few of those with heavy crops this year."

He had written September 2d: "Reports of washouts are still coming in and it seems doubtful whether the damage to cranberry dams alone can be repaired for less than \$100,000....There was a good attendance at the summer meeting of the American Cranberry Growers' Association August 31. The official estimate of the New Jersey crop now on the vines was placed at 80,000 barrels...."

John H. Weinberger, Fort Valley, Ga.

"On a trip to inspect the Fugazzi orchard at Albany, Ga. last week, no abnormal effects of the dormancy-breaking sprays applied in the orchard last winter were noted," he reports September 5th. "A few trees of certain varieties that had been seriously affected with prolonged dormancy have died--sprayed and unsprayed trees alike....Peach rust has practically defoliated peach trees that had not been sprayed for the control of other diseases earlier. Bearing trees still retain most of their leaves, though the disease is spreading on those trees as well. Rainfall has been ample, almost 8 inches having fallen at the Laboratory during the latter part of August. As a whole peach trees in this section seem to be in much better shape than they were last year at this time."

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunegan, Fayetteville, Ark.

"During the week I visited orchards in the vicinity of Springdale and found that apples were dropping badly," he reports September 16th. "I saw small to medium size Collins, Stayman Winesap and Grimes Golden drops being collected and packed. These apples were being sold for prices ranging from 35 to 50 cents a bushel. The growers report that it is necessary to collect the drops every day as the bright sun quickly 'cooks' any exposed fruit on the ground. No cracking of the Stayman Winesap fruit was observed but most growers expect the apples remaining on the trees to crack badly if we should get that much needed rain.

"The young Elberta peach orchard between Springdale and Fayetteville mentioned in a former report was also examined during the week. Bacterial spot has produced almost a complete defoliation in two-thirds of a 20-acre block. The affected trees show numerous cankers on the twigs and have only a small tuft of leaves at the tips of the twigs. Shoot elongation has been markedly reduced and the orchard is the best example of the devitalizing effect of a serious outbreak of bacterial spot that I have seen for many years. The north third of the 20-acre block did not have string beans planted between the rows in 1938 and the trees in this portion are very thrifty, have made a good growth, and have ample crop of leaves. The difference between the trees in the two portions of the field is most striking."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

George P. Hoffmann (Vegetable crop investigations).

"A small planting of tomatoes, pruned and trained in the same manner as the spring crop grown in our pruning and training studies, has set an unusually heavy crop, and as a result of deep setting the plants are not suffering from lack of moisture. This small planting has attracted considerable attention and, to me, the amount of fruit set has been surprisingly heavy."

N. H. Loomis (Small fruit investigations)

"The harvest from this year's grape breeding work gave the following results:

| | |
|--|-----------------|
| "30 crosses (including reciprocals) requiring emasculatation | 3,454 seeds |
| "19 crosses (including reciprocals) self- sterile, not requiring emasculatation | 1,291 do |
| " 6 self pollinations | 2,866 do |
| " 2 crosses and 2 self-pollinations for breeding study | <u>1,112 do</u> |
| | 8,723 seeds" |

ADMINISTRATIVE NOTES

Discounts "We are experiencing difficulty in the payment of vouchers with a discount period of 10 days promptly enough to assure this saving," says a Memorandum for Heads of Divisions from Mr. Allanson, dated August 1. "This is particularly true of vouchers received from vendors through field offices.

"Section 3184 of the Regulations of the Department states that 'It is important that the Government receive the full benefit of all offers of discounts for payment within specified periods. Discounts should not be taken when payment is made after the specified time period has expired, unless authorized in writing by the vendor. Where a contract provides for a discount for cash if paid within a fixed time, and the voucher is paid for the full amount, an explanation should be furnished with the voucher showing why the larger amount was paid.'

"Vouchers must first clear through the Division and then through the Bureau accounting unit to be forwarded to the Chief Disbursing Officer, United States Treasury. All this must be done and sufficient time allowed the Chief Disbursing Officer to write the check within the discount period.

"It is of course important that advantage be taken of discounts whenever possible. It is requested that the attention of employees handling vouchers be called to the necessity of giving these vouchers special attention, both in Washington and in the field. Unless these vouchers are given almost immediate attention, it is extremely difficult to clear them through to the Treasury and have the check written within the discount period. All discount vouchers should carry a 'RUSH' slip through the Division...."

In the majority of cases our field offices send in discount vouchers very promptly. However, we have been advised that certain firms delay sending in bills until the end of the month where a discount is allowed for payment before the 10th of the following month. It is suggested that the voucher be prepared at the time of purchase, signature secured, and mailed to us at once. Where there is delay in receiving the voucher it will be well to insert a note: "Properly certified voucher not received until_____." This would prevent any question as to delay in forwarding the voucher from the field. "RUSH" slips should be attached to such discount vouchers, of course, and at points distant from Washington air mail used if the discount exceeds such postage.

In particular the time involved in getting vouchers to Washington by regular mail from points in the west and southwest leaves a very narrow margin in which to complete the necessary routine handling, a margin that has been somewhat further reduced by moving the Business Office to Beltsville. So we need your full cooperation.

Vol. 11 No. 19

October 1, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI

U. S. Horticultural Station, Beltsville, Md.
October 15, 1939.

No. 20

The Native Chinquapin "Recently there was occasion at Beltsville, to gather a quantity of chinquapins for study and experimental planting," writes C. A. Reed of our section of Nut Investigations. "The chinquapin that grows in this region, Castanea pumila, is a dwarfish tree or shrub, sometimes fruiting when it is as low as three feet from the ground, and it rarely reaches more than eight feet in height. It is decidedly shrubby in every respect, although the ultimate form of each tree is determined largely upon the extent to which it is shaded or crowded. The nuts form singly in the burrs and the burrs arrange themselves compactly together in very perfect racemes, oftentimes with as many as six or eight burrs to the raceme.

"Nuts from the earliest trees began falling about September 1st. The ground underneath immediately became a veritable public commissary for wild creatures. At last the nuts disappeared and the ground was strewn with shell particles.

"A compromise was decided upon by which the trees were stripped clean by clipping the branches immediately below the racemes while the nuts were still green. It was hoped that the burrs would continue to ripen and that the nuts could easily be threshed out. They did nothing of the kind. They promptly dried up and the nuts had to be extracted by hand. Three bushel baskets of burrs and leaves had been gathered. It took four hours of man labor to go through the lot. The net result was exactly 500 grams of nuts; by avoirdupois, this means 1.11 pounds; by measure, there were about a quart and a half pint; by count these small nuts averaged about 520 to the pound."

EFFECT OF STORAGE TEMPERATURE ON PEACHES

Under the above title, M. H. Haller and P. L. Harding of our section of handling, transportation, storage and market disease investigations, discuss, in Technical Bulletin No. 680, just issued, studies on the possibility of storing peaches.

"Since peaches are harvested during the late summer," they point out, "they may be exposed to relatively high temperatures of 80° to 90° F. or above after harvest. During transit they may be subjected to temperatures of 60 to 36 , depending on method of refrigeration and their position in the load. Although peaches cannot be held in storage for long periods, it is often desirable that they be stored for a few weeks to extend the marketing period. It is important, therefore, to know the effect of different temperatures on the rate of ripening and on the dessert quality and composition of the fruit, and to determine the most desirable storage temperature and the maximum length of time that the fruit may be stored advantageously."

The object of the studies reported on, then, was to obtain information relative to the points mentioned. The investigations continued over four seasons, 1930 to 1933, and were concerned principally with the Carman, Belle (Belle of Georgia), Elberta and J. H. Hale varieties. The fruit was obtained from a commercial orchard near Leesburg, Va. in 1930, 1931 and 1932, and from Arlington, Va. and College Park, Md. in 1933. The fruit was picked when shipping ripe and stored the same day--or, sometimes, the following morning.

The writers emphasize the importance of prompt cooling of peaches after harvest if any considerable time is to elapse before consumption of the fruit. If the respiratory rate is used as a measure of the rate of ripening, the results indicate that 1 day at 70°F. is about equivalent to 2 at 60°, 4 at 50°, 8 at 40° or 16 at 32°. The rate of softening is much more rapid at 70° and 80° than at the lower temperatures.

Prompt cooling is very desirable and it is quite important that the cooling continue to 32°F. and not stop between 50° and 36° for any extended holding, since abnormal ripening takes place at these latter temperatures.

Some varieties of peaches may be held long enough for shipment to overseas markets provided the fruit is cooled promptly and held during transit at temperatures of 31° to 32°F., but ordinarily peaches can not be held in storage for more than 2 to 4 weeks, depending on the variety and growing conditions, without serious loss of dessert quality or the development of break-down. A temperature of 32° is recommended for the storage of peaches.

NUT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg.

"Final results of field studies on the relation of stage of development to infection of walnut fruits by Phytomonas juglandis were taken during the week ending September 23d. Results of current studies largely corroborate the results of previous studies on this subject. These studies show that the pistillate flowers are susceptible to infection from the time the flower buds open sufficiently to allow the bacteria to gain access to the interior of the bud and come in contact with the young, undeveloped pistils until the nuts are about $3/4$ grown. The early prebloom stage is apparently the most critical part of this period, as artificial inoculations made during this stage were almost always positive, generally causing lesions at the blossom end, which in most instances resulted in a premature dropping of the nuts.

"Inoculations made during the blooming period and in the early postbloom stage also resulted in a relatively large number of infections but the disease was not so aggressive, the lesions being predominantly lateral and typically extended only to the shell. Inoculations made when the nuts were from half to three quarters grown were likewise positive in a number of cases but the lesions were typically only superficial, being confined to the outer part of the husk. Practically all inoculations made after the nuts were approximately $3/4$ grown were negative. These studies explain why prebloom applications are more efficacious than postbloom treatments.

"Results of studies on the relation of the stage of development of the buds to infection by P. juglandis were also taken during the week. These studies show that the buds of current growth are susceptible to infection from the time the leaf buds of the previous year's growth open sufficiently to allow the bacteria to gain access and come in contact with the young, undeveloped buds in the leaf axils until they are about seven-eighths mature. The forepart of this period (during the early prebloom stage) is apparently the most critical, as inoculations made during this interim caused infection of a relatively large percentage of the buds. As the buds approached maturity, the percentage of positive results decreased. No bud infection occurred from inoculations made during the dormant period."

He had written earlier: "Studies on the cause of brown leaf scorch of walnuts were carried on during the week ending September 2d. Preliminary analysis showed what appears to be a significant difference in the amount of calcium present in healthy and affected leaves. There was definitely more calcium present in the healthy leaves than in the diseased ones.

NUT INVESTIGATIONS

C. E. Schuster, Corvallis, Oreg.

"Filberts are now being harvested and the effects of vigor as compared to low vitality are more pronounced this year than we have ever noted before," he writes September 23d. "The trees with the least vigor and low vitality are maturing their crops considerably ahead of the vigorous, healthy trees. The crop of filberts will be big, although here and there are orchards that are going to be considerably lighter than last year. We can expect a good many orchards to produce over a ton to the acre this year.

"In the walnuts, especially in some orchards, sunburn is quite evident. It is a type of sunburn that will be exceedingly difficult to grade out as it has largely resulted in only a limited amount of shriveling but a great deal of speckling of the kernel. It may be possible that these can be sorted out by the light, soft shells that are being found in some cases but much of the material simply shows specks the size of a pin head or smaller and on up. Apparently these will not be kernels that are greatly shriveled. Consequently the packing houses are going to have difficulty in handling them."

Felix S. Lagasse and Harold M. Sell

Writing from the U. S. Field Laboratory for Tung Investigations, Gainesville, Fla., September 23d, they report:

"During the past week selection of superior individual trees was continued in the field and bud wood from several individuals was sent Dr. Potter for purposes of propagation. A fall check up was made of the condition of each tree selected last season and it was very apparent that there was a great difference in the severity of the cold injury at the different groves....It was also very evident that the greater the amount of fruit on the tree the more susceptible it was to injury by low temperature. In fact, several of the best trees selected last year were so badly injured that they have died, and there is hardly a tree selected at Mr. Tietgens' place that does not now show such serious injury as to make its future existence doubtful....An instance was noted in contrast to the above at Mr. Colvin's, where tree rows in an open field cross what in years gone by had been a barnyard. These trees are twice the size of surrounding trees and this year carry probably from 100 to 1000 times the amount of fruit that trees outside this area carry. It would seem a positive correlation between well fed, vigorous trees and cold resistance in wood and flower bud. Close observation and study of the trees in this area is planned for the future."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

Writing from the U. S. Pecan Field Station and Laboratory on September 30th, he says: "At this season of the year we receive many letters in regard to seeding winter cover crops and many visitors come to the office to talk over this and similar problems. Much of our time is taken up in this manner, but we feel that it is time well spent.

"The chestnut harvest for this year is complete and our records show a total yield of 994.6 pounds from all trees.

"Pecans are maturing rapidly and we will probably start our harvesting within another two or three weeks."

John R. Cole, Albany, Ga.

"On Monday and Tuesday about fifty growers, representing approximately ten counties in Georgia and Florida, visited our experimental plots during intermittent rains in the Taylor orchard," he reports September 30th. "One grower from Dawson, located twenty-five miles west of Albany, was so pleased with these experiments that he made three return trips, bringing other interested growers each time. Scab has caused so much damage to pecans in Georgia this season that growers are really becoming 'scab-minded!'"

He had written September 16th: "The foliage in the uncultivated, unfertilized, and otherwise neglected orchards has mostly shed prematurely, while in well-cared-for orchards the foliage is in excellent condition. There is very little difference in the conditions of the foliage on trees that have received one and two applications of Bordeaux and that on the unsprayed trees, provided they have been winter cover-cropped, fertilized, and summer cultivated.

Ernest Angelo, Bogalusa, La. (Tung Investigations)

"The search for frost resistant or frost escaping tung trees was continued with the scouting of several hundred acres of the Rowlands' orchards," he reports September 30th. "Five such trees were found. In every case these had also produced a crop in 1937, a frost year. We may 'have something' in one or more of these trees.

He had written September 23d of scouting a few hundred tung trees in this orchard in a search for those showing frost resistance. Two such trees were found on this trip, both having a fair crop, considering the fact that other trees in the immediate vicinity were entirely without fruit.

TAKING THE STARCH OUT OF THEM!

An old farmer was out in the field one day, plowing behind his two mules, when suddenly he left them as they were, rushed into the house, and began to put on his Sunday clothes. "Where are you going?" demanded his astonished wife. "I'm going to town to preach the Gospel," was the amazing reply. "But you aren't educated," protested his wife. "You don't know enough about the Bible and religion to preach." The old fellow shrugged his shoulder. "Maybe not," he admitted, "but I've just had a sign--right there in the sky--in big letters--GPC. That means GO PREACH CHRISTIANITY, and that's what I'm going to do." His wife grabbed him by the arm and shook him vigorously. "Get back to those mules!" she shouted. "You derved old billygoat, those letters meant GO PLANT CORN!"

After reading J. Sidney Cates article, "Sweetpotatoes Challenge Corn," in the Country Gentleman for September, we are wondering if the letters might not have been GPS instead of GPC. The Country Gentleman is quite enthusiastic over the new industry involving the use of the sweetpotato in the manufacture of starch. The article discusses the sweetpotato starch plant at Laurel, Miss. This is now opened and operated by the Sweetpotato Growers, Inc., a cooperative association of about 1200 farmers. Owing to the rapid expansion of the enterprise, it was necessary to get further operating loans and these have been supplied by the Farm Security Administration. The Department has been helping with the technical supervision of the undertaking, of course, as you have learned from Dr. Hoffman's items from time to time regarding work at the Laurel plant. The actual operation of the plant, however, and the sale of the starch are in the hands of the cooperative.

"The Bureau of Plant Industry, the old Bureau of Agricultural Engineering and the Mississippi and Louisiana Experiment Stations have all assisted in the research," explains Mr. Cates. "It is an excellent example of cooperation among a number of tax-supported agencies, all working toward a common objective.

"Last year the plant ground 165,000 bushels of sweetpotatoes, and produced 1,650,000 pounds of starch. This year it expects to grind 350,000 bushels of sweetpotatoes. And in 1940--with a dehydrating process installed to permit year-round operation--it is hoped that a million bushels of sweetpotatoes can be handled. Sweetpotato starch has not only stood the test in commercial use, but it is now rated a little better than the imported root starches which we have been using to the tun of approximately 400,000,000 pounds a year...."

As the San Antonio Express (September 14) points out, it would require 300 plants turning out as much starch as the Laurel mill produced last year to replace the 400,000,000 pounds or more of starch now imported, mostly from Java.

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Wilcox, Pemberton, New Jersey

"The commercial crop of Early Black has been entirely picked so far as we can learn," he writes September 30th from the Cranberry and Blueberry disease Laboratory. "Some growers have picked the Centennial and some native Jerseys, but most of the Champion crop is still on the vine and the picking of Howes has been started on only a few bogs. A number of growers have been cleaning and shipping Early Black ever since the fruit has been available. The situation with regard to field rot changed rapidly during September. On most bogs that received a complete spray program, the amount of rot was not excessive at harvest time. In other places, however, field rot developed very fast following the flooding of the bogs during the freshet of late August, and rot has continued to develop in storage on the Early Black that was picked early. A large proportion of this rot showed up on uncolored or poorly colored fruits."

M. A. Smith, Columbia, Mo.

"Beginning Tuesday, September 12, and continuing through Friday, September 15, Missouri experienced a heat wave, the intensity of which is unequalled in the records of the weather bureaus of the State," he writes September 21.

"Such conditions have had a very serious effect on the apple crop in the State. Western and particularly northwestern Missouri suffered materially from strong hot winds experienced the first week of the month. The temperatures and the winds were higher in northwest Missouri than in any district of the State and, due to the fact that growers in that district had little opportunity to harvest previous to the adverse weather, the losses were much greater. Reports from these districts estimate one half to three fourths of the Jonathan and Delicious have dropped which has resulted in a flood of cheap apples on the markets. The damage on later varieties has been material but not as serious as on the two varieties mentioned."

R. B. Allyn, Medford, Oreg.

Reporting September 23d on duty of water investigations, he says: "The laboratory study of heavy clay soil permeability to a $\text{Ca}(\text{OH})_2$ solution continues to show increased flow of water through the soil as compared with a duplication using distilled water. Permeability has apparently been increased three times, and is still increasing, when the $\text{Ca}(\text{OH})_2$ solution was substituted for distilled water on four duplicate samples of soil. Gypsum is now being tried in place of the CaO . The experiment seems to indicate that field trials of a gypsum application should materially benefit the penetration of irrigation water on our soils."

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunegan, Fayetteville, Ark.

"All the 'drops' in our spray experiments were collected and examined during the week," he reports September 23d. "Apple blotch is quite prevalent in several of the plots and with the entire experiment duplicated in two different parts of Ruppel Brox. orchard, it is very evident that out blotch control figures will show marked differences. There is very much less blotch in the plots that we have been spraying since 1936 than in the plots that the owner has sprayed in a haphazard fashion during the same period.

"Excellent material showing Tranzschelia puni-spinosae discolor on almond leaves was received from Dr. L. C. Cochran of the University of California. Teliospores were very abundant on this material and the leaves are being overwintered for teliospore germination tests next spring.

"The Board of Trustees have appointed Mr. William Fulbright, a member of the Law School Faculty, as President of the University of Arkansas."

J. R. Kienholz, Hood River, Oreg.

"A peculiar fruit injury on Bartlett pears was received through Dr. Zeller from Dalles, Oreg.," he writes September 23d. "Fruit was somewhat deformed as in certain types of frost injury, but the deformed areas remained dark green; the green portions being only skin deep. The only guess I could make was the possible effect of some toxic oil or other spray combination.

"The Dalles district was again examined. Their moisture situation is very critical. In fact, peach buds are being killed by what appeared to be a fungus infection. Isolations from the blighted buds and the extending bark cankers yielded no organism. It appears probable the canker formation has resulted from low moisture content and possibly heat injury.

"Apple harvest is under way with growers feeling rather pessimistic about marketing conditions"

HISTORIC PLOW

The Smithsonian Institution has acquired the first steel plow forged by John Deere at Grand Detour, Ill. in 1837, says Science Service. Made of an old sawmill saw because other suitable steel was lacking, it was able to shear through the tough roots of the prairie grasses that balked the relatively feeble eastern-type plows that the pioneers had brought with them. The historic implement will be added to the collection of early American plows already in the Smithsonian Institution, some of which date back to 1797.

PLANT DISEASE REPORTER

Memorandum No. 1059, from the Office of the Chief of Bureau, dated September 21, 1939, reads:

"In order to avoid confusion and possible misunderstanding, it is requested that hereafter all items originating in the various Divisions of the Bureau of Plant Industry and intended for inclusion in the Plant Disease Reporter, be submitted through regular channels for approval by the Chief of Bureau."

A letter of transmittal addressed to Dr. H. A. Edson, Principal Pathologist in Charge, Mycology and Disease Survey, Bureau of Plant Industry, should be prepared for the signature of the Chief of Bureau. Send it with two carbon copies and an original and two carbon copies of the manuscript to Mr. Gilbert for subject-matter editing and forwarding in due course for final consideration. The following form of letter is ordinarily used:

"Dear Dr. Edson:

"Herewith I am sending you a paper entitled _____, by _____. This has been reviewed and initialed by _____ and is offered for publication in the Plant Disease Reporter if you find it suitable."

For purpose of identification, manuscripts should have the standard type of heading: FOUNDATION PLANTINGS. Furman Lloyd Mulford, Associate Horticulturist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture.

BILLS OF LADING

We are having a good bit of trouble with improperly made out bills of lading. Some employees apparently do not realize that their failure to fill in properly the information required by these forms causes irritating delays in payments of large freight bills, to say nothing of the annoyance resulting from correspondence by the Business Office with employees to see that something is done that should have been done at the time the bill of lading was issued.

Please fill in (1) the certificate of issuing officer; and (2) show contents of shipment at least in general terms that will permit freight classification.

ADMINISTRATIVE NOTES

Automobiles: Administrative officers of the Department are calling Thefts of and from. attention to the undersirable frequency of thefts of Government-owned automobiles, or of Government property left in them. These thefts are often the result of failure on the part of the employee operating the car to lock it when he leaves, and to remove the ignition key. Such employees are guilty of negligence and in case of loss are responsible for the loss and subject to reprimand.

"It is of course important alike in the interests of the Department and the individual that carelessness of this character be avoided," says Dr. Auchter in a memorandum (No. 1066) to heads of divisions, dated September 25, 1939. "The theft of a Government-owned automobile, or of Government property from a Government-owned automobile, resulting from negligence on the part of an employec, must be reported as required by paragraph 2921 of the Department Regulations. Where the loss is due to negligence on the part of the employee, in addition to any disciplinary action which may be taken, the employee will be required to reimburse the Government for any loss sustained."

Please call this to the attention of all employees who have occasion to operate Government-owned automobiles.

Christmas Mailing The veterinary was giving instructions to the anxious small boy on how to administer medicine to his sick dog. "It's easy," the doctor assured him. "Just put this powder in a piece of pipe, insert the pipe in the dog's mouth--and blow the powder down his throat. See?" The boy said he did and departed--but he was back in a very short time, gasping and coughing. "What's the trouble?" demanded the veterinarian. "I'm dying," gasped the boy. "That dern dog blew first!"

This, you see, is a little sermon on the importance of promptness. Christmas really isn't far away as you imagine--and, anyway, the Post Office authorities are asking us to plead with you to arrange to do your bulk mailing early so that you can withhold from the mails from December 10 to 26 all bulk mailings of pamphlets and other printed matter. You should also order needed supplies now to avoid having them in the mails after December 10th.

This request in no way affects the handling of ordinary mail, however, but is merely intended to reduce so far as possible bulk mailings of pamphlets, books, supplies, etc. during the December 10-26th period, as such bulky packages not only interfere seriously with the expeditious handling of the holiday mails but may, by reason of their weight, cause damage to Christmas packages.

ADMINISTRATIVE NOTES

An increasing Responsibility "Over and above carrying on the daily routine of our jobs," says a memorandum from the Office of the Secretary, intended primarily for workers in key positions, but of interest to all of us, "each of us has in the present situation two heavy responsibilities: (1) To conduct our work and comport ourselves in all public contacts and statements in such a way as to help maintain the neutrality proclaimed by the President and desired by our people; (2) to supply citizens who ask us for information with the facts and all the facts--but to avoid predicting and commenting until we can have an opportunity to assess the effects upon the agriculture and the trade of America of the new forces at work in the world. Employees who are asked by citizens for information should emphasize these facts....

"Department people in their official and unofficial contacts with the public will make certain, I am sure, that information passed on, formally or informally, is in accord with the facts and that requests for information that cannot be accurately answered at any one office are promptly referred to the Department agencies best capable of supplying the facts. Our Department as a whole and its individual agencies have earned a reputation for conscientious and intelligent public service. The aim is....to help give better and quicker service in the new conditions that now confront our people."

Twine The News Letter of April 15, 1939, told of pending legislation prohibiting the purchase of twine manufactured from commodities of materials produced outside of the United States--except to provide materials required in or incident to research or experimental work. where no suitable domestic product is available.

The prohibition is now law, and where twine manufactured from commodities or materials produced outside of the United States is purchased the voucher must be accompanied by a statement for the signature of the Chief of Bureau, or the officer or employee lawfully acting for him, stating that the twine "is required in or incident to research or experimental work, and no suitable domestic product is available."

Where domestic twine is purchased a statement should be made on the fact of the voucher or invoice to this effect: "I certify that the twine furnished was manufactured from commodities or materials produced in the United States;" or delete the words "substantially all" from the certificate on Standard Form 1034.

We will discontinue items of jute twine when our present supply has been exhausted but will continue to carry in stock twine manufactured from domestic materials.

Vol. 11 No. 20

October 15, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

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Vol. XI

U. S. Horticultural Station, Beltsville, Md.
November 1, 1939.

No. 21

Nut growing at Beltsville For the first time since nut tree planting began at the U. S. Horticultural Station, Beltsville, Md., there is an approach to a good crop of nuts. The first plantings (in three orchards) included many different kinds and types as follows: Varieties of European and American filbert, European, Japanese, Chinese and American chestnuts; chinquapin hybrids, native black walnut, hickory, pecan, various hickory hybrids, Japanese walnut, Persian walnut seedlings from North China, European varieties of Persian walnut grafted on both Eastern and California black walnut stock and crosses of the American hazel and European filbert.

Some of these have fared badly because of their inability to adapt themselves to local climatic and soil conditions. Others are now apparently getting under way, largely because of improved drainage and fertility conditions of soil. Some have been prevented from producing crops because of low temperatures at flowering time. A satisfactory proportion of most kinds is apparently quite promising.

The Persian walnut and pecan species showed less capacity of adaptation than any others. The former mostly died out during the first and second years after planting or transplanting, and the latter, while growing well in early summer both died back with disease or leaf scorch in summer and froze back in winter until out of more than a hundred trees all but about a dozen have disappeared.

The next to die were the European varieties of chestnut. These went out on schedule with blight, as soon as definite infection took place. Some of the Asiatic chestnuts, both Chinese and Japanese, did the same but the percentage of loss was small and now many trees, some of which were set out in the fall of 1934, are bearing full crops.

NUT GROWING AT BELTSVILLE (continued)

Hickory mortality was high, especially with pure species such as shagbark and shellbark, but trees put in good soil spots or moved with sizeable balls of earth have more than held their own. Some are among the handsomest trees in the orchard and some have had both staminate and pistillate flowers for three seasons, but none has yet matured nuts. The hickory hybrids are mostly growing well. Some fruited scantily both last year and this.

The black walnut is responding favorably, now that soil conditions are steadily becoming more favorable. Some trees died during the first two or three years because of standing in water drenched soil for weeks at a time, but those which pulled through until after the land was tilled are now very fine. As is more or less generally the case in rolling land, the best soils are at the lowest and most frosty levels. Freezes at flowering time have greatly curtailed production. Also many of the best trees have been made barren through efforts to make crosses, which so far have been extremely elusive.

The Japanese walnut has been none too satisfactory. Most of the varieties planted have been of the better strain of that species known as heartnut because of the heart shape of the half-shell. These regularly put out great profusions of flowers each spring, both staminate and pistillate. They set many nuts but mature very few and most of these are undersized and rarely well filled. Some contracted a disease of the Witch's Broom type, which is not yet well understood. None has died on that account but unless there is improvement soon or favorable response to treatment they will doubtless disappear. Two varieties are strong growers and make fine ornamentals but so far they have fruited moderately. Others are fair ornamentals but bear nuts in moderate quantity only. All varieties are largely or completely dichogamous.

Incidentally, the Japanese walnuts are mainly the "poor relations" of the butternut. It was because they came from wilds on the opposite side of the globe (northern Japan) that they early attracted much interest in this country. Had the American butternut also been a product from some remote wilderness, it would undoubtedly have been much hunted and widely acclaimed when found, but being common in the northern woods near home it is little known to planters generally. Actually, good butternuts are among the world's most pleasing nuts, especially for confectionary use. A few trees, set out in the fall of 1934, are fruiting at Beltsville.

Filberts have received greater attention at Beltsville than has any other group. Fully half of the total land devoted to nut trees has been planted to *Corylus* trees. About fifty trees of the first planting represented some fifteen or twenty European varieties. All others were

NUT GROWING AT BELTSVILLE (continued)

hybrids resulting from crosses of three (mainly one) varieties of native hazel and European filberts. A majority of the pure European sorts died early, unable to withstand the drouchy conditions of sites where they were planted, and the severe winters. Several varieties are now doing very well. The hybrid filberts are performing variously, as was to be expected. The great majority justify but little comment. However, the whole group is of interest from a genetic point of view. In most cases the pollen parent has been remarkably dominant. Oftentimes the characteristics of shoot growth, leaves, husks and nuts have been strikingly like those of the staminate parent. In many cases the nuts are hard to distinguish from those of the pollen parent. Regardless, however, of parentage, the best growing and best bearing trees are in the best soil. On the whole, the current crop is the best of any year so far.

Perhaps the most promising of all species of hybrid forms of any with which work is being done at the Beltsville station is the chestnut group, especially certain forms coming from the Orient. Many trees put out in 1932 and later are now bearing freely. More will be said about this group at some later date. For the present it will suffice to say that branches of many trees are heavily weighted down with fruit. Nuts from a good many of the Chinese seedlings are thoroughly palatable. The same is true of occasional seedlings from Japan....Early maturing filberts of German varieties began ripening at Arlington Farm by the middle of August. The main harvest of the hybrids, now since the last of September and during the early part of October is at midseason. The chestnut harvest is now (October 10) practically completed. Black walnuts are rapidly falling to the ground. The Japanese walnuts are usually ten days to two weeks ahead of the black walnuts. The few butternuts were about with the heartnuts. Had there been a crop of Persian walnuts, the harvest would have been well along judging by the usual season for the occasional trees in Maryland, the District of Columbia, and Virginia.

----- ADMINISTRATIVE NOTE -----

Christmas Mailings Don't be forgetting to remember to get bulk packages in the mails before December 10th! The Post Office authorities have asked us to withhold from the mails during the December 10-26 period all bulk mailings. Large packages not only interfere with the expeditious handling of the holiday mails but, because of their weight, may cause damage to Christmas parcels. Plan to limit your mail to general correspondence from December 10 to 26, inclusive. We'll promise to use lighter material in the News Letter!

NUT INVESTIGATIONS

John H. Painter, Cairo, Ga.

(Tung Investigations)

"It appears that height growth has practically stopped in the nursery at Lloyd, Fla.," he writes October 7th. "The majority of the selections measured showed little if any gain and the maximum height growth was but three centimeters compared to twelve and fifteen centimeters increase previously reported...."

"Numerous instances of zinc deficiencies have appeared in this area for the first time. From a fairly reliable source of information we have been advised that 'bronzing' is often more noticeable in a wet season such as we have experienced this year. The writer has seen symptoms of 'bronzing' in three orchards this year in which he is positive there was none last year."

Ernest Angelo, Bogalusa, La.

(Tung Investigations)

"Scouting orchards for 'that tree' with a large crop while its neighbors had their buds killed by frost last spring, has occupied most of the time of the greater part of our staff," he reports October 7th. "We have observed approximately ten thousand tung trees daily during the past week and selected from this number seven trees. This does not mean that there were only seven trees bearing fruit, as in some cases a small clump of several trees might be fruiting in which case the trees were 'passed up' as it indicated the temperature may not have gone so low as elsewhere in the orchard. A few of the selections made to date appear quite promising as they have produced crops in 1939; 1938, 1937 and 1936."

Milo N. Wood, Sacramento, Calif.

"The last two weeks in September were largely occupied in obtaining data with reference to the hybrid trees in Field 6....Altogether we will discard about two thousand trees this year. It is noticeable that many of the trees possess qualities that make them especially valuable for possible use in future breeding work. All of these will be saved...."

"It has been found that some of the new hybrid trees are especially susceptible to brown rot and others appear to be quite resistant. This offers another line of importance to work upon. If we could get a Drake nut that would be immune to brown rot infestations it would be of great value to the industry. To date the spider resistant trees are very promising. The red spider is probably the most damaging of the insect pests to orchards and brown rot is the most damaging of the pathological diseases...."

NUT INVESTIGATIONS

John R. Cole, Albany, Ga.

Writing from the U. S. Pecan Disease Field Laboratory on October 21, he says: "On Tuesday Large and I drove to Cairo and took records in the Wight Nursery where we sprayed during the past season to control the nursery blight disease. The disease was controlled 95 percent on the plot sprayed four times as against 60 percent on the plot sprayed three times with 3-1-50 bordeaux mixture. The control on the plot sprayed one and two times was not much better than the check trees. The only trees that grew large enough to set buds in were those that were sprayed at least three and four times. Photographs showed the contrast between the trees in the check and sprayed plots.

"We are not making much progress with our harvest because the nuts are not ripening as early as they did last year. The temperatures have been unusually high, which no doubt accounts, at least partially, for this delayed ripening. This late maturing of the nuts makes it difficult for us to protect them from the birds and squirrels."

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunegan, Fayetteville, Ark.

"The drought continued until the night of September 28th when a terrific electrical storm brought very much cooler weather and 0.84 of an inch of rain. The storm was preceded by high wind and the ground under our count trees in Ruppels orchard is covered with apples even through the drops were collected September 25th. During the course of the storm some hail fell in scattering sections and the examination of our experimental fruit shows a trace of hail injury in the form of numerous small bruises on the almost mature fruit."

G. A. Meckstroth, Willard, N. C.

Writing from the Coastal Plain Station of September 30th he says: "Our blueberry spray plot at Mrs. Crabbe's is giving us a fine demonstration of practical control of powdery mildew and leaf spot. The check row is badly spotted and mildew is rather bad. The row receiving only the dormant spray is almost as bad as the check row, as far as leaf spot and mildew are concerned, while the row receiving dormant plus summer spray is practically free of leaf spot and mildew. Powdery mildew is found only on the very young leaves, indicating that an early application of summer spray would have given better control. The summer sprays were applied July 5 and August 31."

DECIDUOUS FRUIT INVESTIGATIONS

John H. Weinberger, Fort Valley, Ga.

"Several growers and nurserymen at Concord in the north central part of the State who are planting Dixigold were visited in connection with a survey trip during the week," he writes October 16th. "This is the farthest north in Georgia that this variety is being planted that I am aware of. It was learned that Sullivan's Early Elberta sport looked promising in that section last season and about 50,000 trees of it have been sold. Halehaven is also being planted for the first time in the Thomaston area. Drake has finally named the new peach of which he has reputedly sold 100,000 trees in this State Fleming Gold, alias New Deal, Richland, Drake's Early Yellow Free, etc. The six standard varieties of Georgia are being added to rapidly.

"On Saturday twigs of Hiley and Early Rose were brought into the greenhouse and sprayed with chemicals to break the rest period. Earlier results had indicated that the rest period was more difficult to break after cold weather had set in than just after leaf fall. This is being checked up at present."

R. B. Wilcox, Pemberton, N. J.

Writing from the Cranberry and Blueberry Disease Laboratory on October 14th he says: "Mr. Bain was with us until the 8th. It was impossible to harvest fruit from the hybrid seedlings on the 2d and 3d, but with the help of an extra picker the last seedling was picked late in the afternoon of the 7th. There had not been even a light frost on the bog during the entire fall, so the examination of the fruit will not be complicated by the presence of any frosted berries. Mr. Bain returned to Washington on the 8th with over 1,500 samples of mid-season and late cranberries, which taxed the capacity of his car to almost the extreme limit. More than 10 percent of the seedlings had furnished over a quart of berries each; in all these cases the fruit was divided and part of it left at Pemberton for storage test. This fruit alone amounted to nearly 1-1/2 barrels. Because of the warm weather, the early berries had been rather slow in coloring, but color developed rapidly by the 1st of October, so that even the latest-ripening varieties could be harvested. The work was well organized and progressed very satisfactorily.

"Most of the commercial cranberry bogs in New Jersey have now been harvested, although a few growers have small areas yet unpicked. We do not yet know what the total crop for the State will be, but nearly all bogs fell short of their estimated crops. The gathering of 'floaters' is still in progress in many places. Considerable quantities of the Early Black have already been shipped or sent to the canneries."

THEN, ANOTHER LITTLE PEACH IN THAT ORCHARD GREW!

My grandfather once paid the late P. T. Barnum 10 cents for the privilege of viewing a horse "with its head where its tail ought to be." What he actually saw was a perfectly normal horse that had merely been backed into his stall, so that as a matter of fact his head was where where his tail ought to have been. Well, grandfather was from Missouri--he had to be shown.

I'm wondering if they are still backing horses into the stalls in Missouri--deliberately or accidentally? The Lamar (Mo.) Democrat, September 8, 1939, reports the miraculous behavior of a peach tree out there--"an anomaly...a horticultural mystery," declares the Democrat's editor. He may be right--if his observations are absolutely correct. Or has he been looking at a backed-in horse?

With the peach tree in question, it is reported that the first crop of large freestone peaches was picked about the middle of August. Early in September some of the children told the tree's owner that there was a second crop growing on it--a second crop of peaches, we mean! He didn't pay any attention, thinking that the children were joking. A few days later, however, they came in with more peaches, claiming they had picked them from this tree. The owner went out for a look--and almost fainted! There was a scattering crop of small, flat peaches on the tree he is positive he picked clean of fruit in August.

Our hesitation in going overboard on this horticultural phenomenon arises from the fact that there are varieties of peaches, pollen sterile, which under certain weather conditions in the spring have flowers that though not fertilized do develop and set fruit, with no embryos in the seeds. These fruits usually remain small while the normal, fertilized fruits grow to maturity and are harvested at the regular time.

These small fruits are on the tree at the time of the regular harvest, you understand, but are then so small they might quite easily be overlooked. They do not ripen for a month to six weeks after the normal fruits are picked. There is the possibility then, that the Lamar tree had such tiny fruits when the first crop was harvested but they were not observed.

If the owner is absolutely correct in his statement that there were none of these small peaches on the tree when the big ones were picked, the phenomenon is indeed, as he expresses it, "a horticultural mystery."

However, my grandfather was from Missouri--and, after all, heredity is a powerful thing!

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Allyn, Medford, Oreg. (Duty of Water Investigations)

"A revision of the soil stability-available moisture calibration for the experiment station soils has been completed and a tabulation of available moisture determinations by the availabilimeter shows that generally its accuracy on all plots through the past season has been within 5 percent of duplicate samples run through the oven. This short-cut method enables determinations to be made with good accuracy directly in the field in a few seconds as compared with 48 or more hours delay by the conventional method."

N. H. Loomis, Meridian, Miss.

"During the week ending September 30th, 191 vines were pulled from the seedling test vineyard and 202 from the nursery, due to foliage breakdown typical of unadapted varieties or susceptibility to anthracnose. (Vines having serious foliage breakdown in the fall are generally dead the following spring or may linger on through another summer.)...In summarizing the parentage of the seedlings it was found that Lenoir, Herbemont, Caco, Champanel, and Dog Ridge transmitted vigor to the seedlings, while seedlings of Carman, Delaware, Ellen Scott, Fredonia, Golden Muscat, R. W. Munson, and Sheridan are generally weak. There is increasing evidence that vigor of grape seedlings and older vines may be directly related to nematode resistance. The native and adapted species should be used to a greater extent in breeding work."

HANDLING, TRANSPORTATION, STORAGE, AND MARKET DISEASE INVESTIGATIONS.

Edwin Smith, Wenatchee, Wash.

"Progress is being made with the preparation of apples for storage decay studies." he writes October 17th. "We have made the late picking of Delicious and tomorrow will complete the washing and packing after one week's delay in the orchard and at 30°. The first picking of Winesap apples at Peshastin was made October 12 and the late picking will be made on October 23. The commercial harvesting in this orchard will have been completed by that time....All apple crops are turning out smaller than estimated. The total crop will be smaller than in any recent years. Most of the picking in this vicinity will be finished this week. Prices are very low. Offers of 85 cents per box are all that are being made to growers for Extra Fancy Winesaps."

"Mr. English has obtained about 2,500 pieces of material for sectioning and has used Clement's method of staining 20-apple samples of different lots of Delicious to observe the number of open lenticels. After immersion in the dye for 24 to 36 hours a surface examination has been made with dissecting binoculars. This has been very interesting as the dye penetrates microscopic apertures and stains the epidermal tissue, making apparent washing injuries that would not have been observed under microscopic examination...."

HEAT AND RAIN CAUSE CROP LOSSES IN SOUTHERN CALIFORNIA

Recent issues of Southern California newspapers indicate that rather severe losses were caused by the recent combination of heat and rain, including a period of seven days when the thermometer ranged from 100 to 107°F., followed by a severe tropical storm that left as much as seven inches of rain in its wake. It is now estimated that the Coachella Valley will lose about 6,000,000 pounds of dates; the Imperial Valley's 50,000-ton alfalfa crop was cut in half; Kern County's 76,000-bale cotton crop was damaged \$5.00 a bale; and all the oil was drawn out of ripe orange skins by the heat in some areas.

G. L. Rygg, assistant physiologist in Mr. Fisher's section of handling, transportation, storage and market disease investigations, had some first-hand experiences with this very unusual visitation. Early in September he was returning to the U. S. Horticultural Station (Date Garden) at Indio, Calif. to resume his official duties after spending some time in graduate study at the University of Minnesota. At Yuma, Ariz. he learned of heavy rains that had been falling in southern California about Labor day. The greater volume of rain fell from September 4 to 6, though the rain did not stop completely until the following week. He was told that the heaviest downpour had been to the south and east of the Indio station, and he discovered that considerable damage had been done to roads and property near Thermal, and that railroads and highways had been washed out on both sides of the Salton Sea, and both east and west of Blythe on the road to Phoenix. The train on which he traveled (Southern Pacific) was delayed about seven hours in Phoenix, and again in Yuma, so that it required about fifteen hours to make the Yuma-Indio trip, ordinarily a 3-hour journey. The Santa Fe road was also washed out in some places. All in all, Dr. Rygg reached Indio some 24 hours behind his schedule.

Now he writes Mr. Fisher of a second rain visitation: "On September 24th, 6.45 inches of rain fell between about 5 a.m. and noon, and then for good measure early the next morning another .33 inch fell, making a total of 6.78 inches. This overshadows the rain early in September, as far as Indio goes, as at that time the total amounted to only 2.30 inches although south and east of here there was much more. This gives us a total of 9.08 inches for 3 weeks in September, compared to a normal of .21 in. and compared to a normal annual rainfall of 2.96.

"The damage to dates caused by the last rain was not in proportion to the quantity of rain by any means. The air has been reasonably dry and cool since the rain quit falling. Estimates on date injury vary from 60 to 70 percent or more. This will result in the smallest harvest in many years instead of the largest in the history of the American date industry, as was anticipated. The heavier part of the rain was somewhat localized but it covered most of the date sections. It did not extend into the mountain sections, though lighter rains fell on most of the southern part of the State."

SUBTROPICAL FRUIT INVESTIGATIONS

H. E. Stevens, Orlando, Fla.

"Anthracnose, bloom blight, leaf spot, and fruit spot are common terms applied to attacks on the mango tree in Florida by the fungus *Colletotrichum*," he writes from the U. S. Subtropical Fruit Research Station.

"This fungus is found widely scattered and abundant in regions where the mango is grown and under favorable conditions of moisture and temperature may cause serious injury to the foliage, bloom and fruit of this tree. Very few of the mango varieties grown in Florida show any appreciable degree of resistance to the disease and the Haden, which is the chief variety grown for shipment, is severely attacked particularly the bloom and young fruits.

"A shortage of the Haden crop is generally believed to be due to attacks of this fungus in the bloom and on young fruits, and excessive sprayings with bordeaux mixture have failed in the past to hold a normal crop of fruit until maturity.

"Our spraying experiments during the past six years have demonstrated that timely applications of bordeaux mixture will sufficiently protect a crop of fruit after it has set, and that a poor set of fruit or a short crop is not necessarily due to attacks of the fungus, especially where the Haden variety is concerned. This variety seems to have a high degree of self and inter-sterility and it will only set and hold a moderate crop of fruit in occasional seasons. The tree blooms heavily, and an abundance of young fruits apparently set, but these shed off in two or three weeks' time due apparently to embryo abortion. The shedding of young mango fruits is one of the problems in growing the Haden mango. There seems to be no definite relation between this excessive shedding and moisture, temperature, or attacks of parasitic organisms such as fungi and bacteria. Insect attacks are apparently not concerned with the problem. There is probably some inherent character in the variety itself, as suggested, that is responsible for the low percentage of normal development of fruits since other varieties under the same conditions will set and mature an abundance of fruits, while the Haden matures practically no fruits.

"Dry warm weather during the period that the mango is in bloom is conceded as favorable to a heavy set of fruits. This is more or less true with the seedling varieties grown in the State, but it only applies in a limited way to the Haden. The bloom may appear in early December and flowers begin opening from the middle of December to the middle of January. Usually the bulk of the Haden crop is set from the early bloom.

SUBTROPICAL FRUIT INVESTIGATIONS

H. E. Stevens (continued)

If the bloom has not been general over the tree, a second bloom may appear in February and March, and sometimes a third flush of bloom will appear in late April or early May. The late blooms generally appear during our dry season but as a rule very little fruit is ever matured from the late flushes of Haden bloom. It begins to shed in a week or two after it apparently sets. Spraying will not prevent fruit droppage, but if a crop is set it can be satisfactorily protected from anthracnose by four or five applications of bordeaux mixture during the season.

"During five seasons of spraying in which five applications of bordeaux mixture (3-3-50 and 4-4-50 formulas), were made per season, from 61.8 to 88.1 percent of fruit free from anthracnose or the effects of the fungus *Colletotrichum* were obtained. Four applications per season of the same strengths of bordeaux mixture in the same experiment (five years) resulted in a range from 52.7 to 84.3 percent of fruit free from anthracnose. On check trees that were unsprayed over the same period, the percentage of fruit free from anthracnose ranged from 6.7 to 47.0 percent. The bordeaux applications also added to the keeping qualities of the fruit, as sprayed fruits held up six to eight days longer in holding test than the unsprayed fruits."

Harold F. Yates, Gulf Coast Substation, Fairhope, Ala.

"Another Satsuma harvest season is at hand," he writes October 15th. "Although we have made two light pickings on some of the earlier varieties the main crop will not start moving until the latter part of October. The maturity of the crop is about normal this year.

"The winter of 1938-39 in our immediate locality was ideal for the Satsuma trees. However, some isolated areas in the Satsuma section suffered very heavy losses from low temperatures. Some areas had temperatures as low as 18°F.; whereas our low for the winter was 24°. Several of the orchards in the low temperature areas were completely defoliated with severe wood damage and have no fruit this year. Consequently the total production of Satsuma oranges in the Gulf Coast area will be much less than last year. The two low temperatures recorded on the station came November 18 and February 23, 23° and 24°F., respectively.....The crop on the Station this year is very good. The yield per tree will be about the same as last year, which was quite good. The fruit size will average larger and apparently will be of high quality.

"The damage from Bonded Leaf-footed plant bug (*Leptoglossus phyllopus*) is very noticeable on the earlier maturing varieties this season as has been the case in the past. This may be due to the earliness or the thinner skin of these varieties."

NO MATTER WHAT YOU CALL IT, IT'S STILL SPINACH!

The little boy who prayed long and earnestly that vitamins might be put in candy instead of spinach, wouldn't be very enthusiastic, I fear, about Circular No. 526, "Orach, Its Culture and Use as a Greens Crop in the Great Plains Regions," by M. F. Babb and James E. Kraus of the Division. Orach, you see, is a substitute for spinach. As a matter of fact, it was an important food plant for mankind long before the introduction of spinach, but the latter has gained the upperhand for general culture. But orach will grow satisfactorily in the central Great Plains and intermountain regions where it is virtually impossible to grow spinach. The circular describes the use and possibilities of orach in these regions.

Incidentally, it appears that the News Letter has a golden opportunity to set the horticultural world straight on the pronunciation of "orach". It has come to our attention that some of our own people are referring to the crop as "Oh-rak." If Mr. Webster's famous dictionary, as well as the background of French derivation, counts for anything, it is "ōr'ach", with the last syllable as in "spinach." I don't know just what the views of Messrs Babb and Kraus are on this subject, but you can see what a calamity it would be for the Division to have even an indirect part in the spread of an incorrect pronunciation; especially since, as a substitute for spinach, orach is apt to be called various things anyway, in spite of our best efforts.

ADMINISTRATIVE NOTES

Price Employees who have occasion to purchase laboratory materials
Quotations should be warned that because of present unsettled world conditions, affecting the cost of domestic as well as imported merchandise, and because dealers do not know just what conditions they may have to face from day to day, all quotations are being made for the most part for immediate acceptance and immediate delivery.

"Chemical prices are changing daily," one dealer in laboratory apparatus, chemicals and rubber goods writes to Ray Jones, "and we have already received a price increase on rubber materials. In a majority of cases, quantity discounts have been withdrawn on items that must be imported. During the existing emergency, orders will be invoiced at current prices. You can rest assured that it is our aim to maintain prices at their lowest level, and that when it is necessary to increase prices the increase will be made as moderately as possible.

"We are also experiencing some delay in securing merchandise from our sources of supply, and as this situation will, undoubtedly, continue in the near future, we suggest that you take this situation into consideration and place orders as far ahead as possible."

ADMINISTRATIVE NOTES

Noiseless Typewriters The noiseless typewriter is more expensive than the regular machine, the excess in cost running up to some 16 percent at times. Under the circumstances, attention should be paid to the request contained in the Secretary's Memorandum No. 772, dated August 15, 1938, that "purchases of noiseless typewriters should be limited to instances where there is definite and justifiable need for such special equipment."

Memorandum No. 1067, from the Office of the Chief of Bureau, dated October 4, 1939, states that hereafter a request for the purchase of a noiseless typewriter must be accompanied by a memorandum fully outlining the circumstances necessitating the purchase of the noiseless machine rather than the standard typewriter. All contemplated purchases of noiseless typewriters will receive careful scrutiny from the point of view of Memorandum 772, quoted in the first paragraph above.

Leave Section 15 of the Executive Order prescribing regulations relating to annual leave of Government employees has been revised to read:

"Sec. 15 Temporary employees who subsequently receive indefinite, emergency, probational, or permanent appointments in the same department or agency without break in service shall be entitled to 2-1/2 days annual leave for each full month of service to the date of such indefinite, emergency, probational, or permanent appointment and thereafter at the rate of 2-1/6 days per month, and shall be credited with such accumulated and current accrued leave as may be due, or charged with any unaccrued leave which may have been advanced."

Section 18, relating to sick leave, has been revised to read:

"Sec. 18. Sick leave accumulated during temporary appointment shall be credited to an employee who received an indefinite, emergency, probational, or permanent appointment in the same department or agency without break in service but shall not be transferable elsewhere under any circumstances."

The Bureau, of course, limits employment under letter of authorization to intermittent workers and ordinarily to a maximum of 90 days in any one fiscal year. Wherever regular appointment can be made through the Washington office and payment made on pay rolls submitted through the usual channels, that should be done. Employment under letters of authorization must be definitely restricted to intermittent employment, and only when regular appointments are not practicable. It is preferred that employment of intermittent workers be made through appointment whenever practicable.

Vol. 11 No. 21

November 1, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

SEM I - MONTHLY NEWS LETTER.

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI U. S. Horticultural Station, Beltsville, Md.
November 15, 1939.

No. 22

Every Day is Thanksgiving! There seems to be an argument in some of the States as to whether November 23 or 30 shall be observed as Thanksgiving Day this year; but every day is Thanksgiving Day for our stockholders. Strike the cymbals and sound the drum! Research dividends--here they come! The cymbals and drum are merely figurative, however, as what I have in mind is a bit of horn blowing--just a mere toot; you understand, on the basis of a report that Dr. Sitton has sent us from F. W. Dodge who supervises the work at the U. S. Pecan Field Station, Robson, La.

"One Moore tree in the variety orchard yielded 111 pounds and one Moneymaker tree yielded 72 pounds," writes Mr. Dodge. "The Moore trees in the pruning orchard averaged 29 pounds per tree and the Moore trees in the variety orchard yielded 82 pounds per tree. This difference is the effect of soil type since the trees in the pruning orchard are in clay soil while those in the variety orchard are in loam soil. A similar difference has been apparent every year, showing the superiority of the loam as a pecan soil. The Moneymaker trees averaged 22 pounds per tree for the trees which have been sprayed with bordeaux and no crop from the unsprayed trees. This difference of 22 pounds per tree amounts to \$1.90 revenue per tree at our contract sale price of the nuts. This allows about \$1.40 return per tree above spray cost for the sprayed trees. Thus the sprayed Moneymaker trees have returned more than \$24.00 per acre for cultivation, etc., while the unsprayed trees have returned nothing. Looking at it another way, the spraying returned about four dollars for each dollar spent, and turned a loss into a good profit."

Four dollars for every dollar invested! Even Dr. Crane says--as shouldn't--"I consider this real results."

NUT INVESTIGATIONS

Dodge writes for the week ending October 28th: "With the end of this week we have harvested a total of 7300 pounds of pecans; 4500 pounds of which were harvested this week. To date we have harvested 3000 pounds of Schley, and have about 500 pounds more to harvest; 1500 pounds of Moore; 1200 pounds of Moneymaker; 400 pounds of Western; and the balance of other varieties. We have all of the Success yet to harvest and a lot of the variety orchard. At present it is apparent that we will have a marketable crop of 9,000 to 10,000 pounds, which is better than we had last year. There are fewer nuts this year than last, but they are larger and better filled.

"Shuck worm infestation is as bad this year as it was last year, but in spite of this it is almost impossible to find nuts that will not grade U. S. No. 1.

"Interesting yields resulting from the application of bordeaux sprays have shown up this week better than had been forecasted. This week we harvested 70.2 pounds of nuts per tree from bordeaux sprayed Bass trees, and none at all from the unsprayed Bass trees; 60.0 pounds per tree from bordeaux sprayed Lewis trees and 25.0 pounds from the unsprayed Lewis trees; 30.8 pounds from the bordeaux sprayed James tree, and no crop from the unsprayed James trees; 13.0 pounds per tree from the bordeaux sprayed Van Deman trees and 0.9 pounds per tree from the unsprayed Van Deman trees; and 6.9 pounds from the bordeaux sprayed Major tree, and no crop from the unsprayed Major tree. These differences together with those reported with the Moneymaker were expected; however, an unexpected difference has shown up with the Schley. Bordeaux sprayed trees of this variety yielded 18.8 pounds per tree while unsprayed adjoining Schley trees yielded only 10.1 pounds per tree.

"This makes seven varieties harvested to date that have shown increased yields resulting from applications of bordeaux sprays. In all cases except with Lewis and Schley the spray has turned an unprofitable investment into a profitable one; with Lewis and Schley the increased yields of nuts resulting from spraying has paid 200 to 300 percent returns for the investment in spraying."

Commenting on this report, Dr. Crane adds: "This is the result of preventing premature defoliation, caused primarily by downy spot and vein spot. Pecan trees to bear good crops must keep their leaves until frost."

Writing of a visit to the Skannal orchard, Dr. B. G. Sitton reports a very good crop of good quality Success pecans as being harvested during the week ending October 28th. "Two trees harvested while I was at the orchard yielded more than 500 pounds of pecans each," he writes.

NUT INVESTIGATIONS

Milo N. Wood, Sacramento, Calif.

"During the last two weeks considerable time has been spent in the field," he writes October 21, "Investigation shows that the almond trouble we have called the 'peculiar disease,' for want of a better name, is spreading in some orchards. For about three years I have been advising growers who have trees suffering to any extent with this trouble to remove them and replant with healthy trees. In case the trouble is contagious this would prevent its spread and, anyway, once the trees get the disease they are of no value from a production standpoint. Quite a number of growers have removed the trees in some of the orchards considered to have suffered most from the trouble.

"As far as I have been able to investigate the new hybrids Jordanolo and Harpareil they came through with very good crops against this year. In some orchards in the northern part of the valley these trees came through with good crops although some of the Nonpareil and Ne Plus Ultra were light in these particular orchards owing to frost injury. Some growers think the Jordanolo is rather tough and will stand considerable frost. This may, however, be simply a matter of opinion as it may be that the trees, although early bloomers, missed both the early and late frosts.

"Some of the growers tell me that they propped the branches of the Jordanolo to prevent breakage owing to the heavy crop. This is probably not necessary as the wood of this variety is quite tough and the branches seem to bend with their load without breaking. While the almond crop has been heavy this year, some orchards have produced much less than was estimated. We, of course, thought that this would be the case in non-irrigated orchards where the nuts tended to run to a small size. I have noticed, however, that even in some of the irrigated orchards the nuts did not size up as much as would be expected. This may be due to the fact that the weather during the entire time the nuts were developing was such that the number of days of good growing weather was somewhat less than usual. Because of the exceedingly dry year, there has been a considerable quantity of low grade almonds. In many of the irrigated orchards almonds of fine quality were produced.

"The hot weather occurring during the latter part of the walnut ripening season seems to have done considerable damage. A great quantity of dark kernels has been the result. Also, lack of filling has been evident, especially where moisture was lacking. While I have noticed the walnut orchards over a rather limited area, I think that the damage in regard to quality of the nut will be far greater than the average. Some have already estimated the damage to have amounted to over a million dollars."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

Writing from the U. S. Pecan Field Station and Laboratory on October 28th he says: "On three occasions visitors were conducted to our experimental blocks during the week.

"Most of the earliest maturing varieties in the orchards at Philema were harvested. About three times as many nuts of these varieties have been harvested as in any previous year and if the other varieties show as great an increase we should harvest from all our trees between 20,000 and 25,000 pounds. Size and filling are both good....

"Peanuts are almost all threshed in this section and with labor available pecan harvest is going ahead rapidly. Early harvested Moore and MoneyMaker nuts sold for 9-1/2 to 10 cents per pound, field run. Stuart pecans are being quoted at 11 to 13 cents per pound and Schley at 15 to 18 cents. The market is fairly strong at present but fear has been evident that prices would drop in the near future due to the effect of very large walnut and filbert crops and heavy importations of brazil nuts. The pecan stabilization program has not yet been approved."

Paul W. Miller, Corvallis, Oreg.

"Most of the week ending October 21 was spent in field studies of the relation of spraying walnuts for the control of bacteriosis to the yield.

"The crop was harvested from the most important sprayed and unsprayed plots at our field stations located near Aumsville and Scholls, Oreg. While dry weights are not yet available the plots sprayed with both bordeaux mixture and copper oxalate had a significantly larger crop on the wet basis than the untreated plots. Thus, in tests carried on in an 18-year old Franquette orchard near Aumsville, Oreg., a plot of 20 randomized trees sprayed with bordeaux mixture 6-2-100 yielded on the average 37.5 pounds of nuts per tree; a plot of the same size sprayed with copper oxalate 3-100 averaged 36 pounds of nuts per tree, while an untreated plot yielded 26 pounds of nuts per tree; an increase of 11.5 and 10 pounds per tree, respectively, from spraying with bordeaux mixture and copper oxalate. Moreover, there was an evident increase in the amount of gradable nuts in the sprayed plots that will undoubtedly show up in the grade records.

"Walnut harvest is now in full progress in grafted Franquette orchards. From a preliminary survey, the quality of the crop appears to be good, considering the relatively dry season that we have experienced this year in the Pacific Northwest."

NUT INVESTIGATIONS

George F. Potter, Bogalusa, La.

"The search for the ideal frost resistant tung tree has been the principal field activity throughout the period from October 9 to 21. Dr. Angelo assisted by Mr. Campbell, Mr. Merrill, and a corps of laborers has been on the march daily through the most promising tung orchards in this area. When a tree is found bearing fruit in areas where others have been completely or practically completely frosted out, it is examined to determine whether or not it was fruitful last year and also in previous seasons during some of which frost occurred. For this reason the search is limited to those orchards where the trees are old enough to have borne four or five crops.

"On a good day when the work is all in one large block and the planting of such a character that it is not difficult to find one's way about, as many as 120 acres with a total of perhaps 10,000 trees may be examined daily. On other days, when working in small blocks or in orchards planted on the contour, the area worked over in a day may drop to 20 acres. To date a total of 54 selections has been made, 27 in Louisiana, 24 in Mississippi, 1 in Alabama, and 2 in Texas. Some of these trees appear very promising, but in no case are we certain that the frost resistance is inherent. A liberal number of selections is being made because we anticipate that many will eventually prove to be worthless.

"Mr. Hines has continued his studies on the so-called 'crotch canker.' The very alarming symptoms of this trouble turned the scale and led us a year ago to include a pathologist on the staff of the tung investigation. It was observed last year on about a dozen or fifteen trees in one orchard. By the time Mr. Hines' appointment became effective the trees were practically dormant, the disease had reached an inactive stage, and his isolations from the tissue included a large variety of miscellaneous organisms. It was tentatively concluded that the trouble was a rather peculiar manifestation of cold injury. No signs of disease were seen this season until September, the same time of year that it was observed in 1938. A larger number of trees were affected and there were also some in another orchard in the same immediately locality. The isolations seem to indicate that a bacterial fermentation of the sap is taking place, but it is still uncertain as to whether or not this is the primary cause. Mass inoculations with infected tissues have failed.

"Mr. Hines has experimented with the surgical removal of the diseased areas and treatment of the wound with bordeaux paste or acid cupric chromate solution. This treatment has been successful in eliminating the disease provided that every bit of the affected tissue is removed. If even a small amount remains, the disease starts up afresh."

NUT INVESTIGATIONS

John R. Cole, Albany, Ga.

Writing from the U. S. Pecan Disease Field Laboratory on October 28th he says: "Growers continue to visit us, coming from Iowa and South Carolina during the week. Since all unsprayed, as well as some of the sprayed Schley, are going to be lost as a result of the scab disease, the number of growers spraying next year will probably be double the number that sprayed the past season. The growers from South Carolina spent one and one-half days inspecting our experimental plots and surrounding orchards."

DECIDUOUS FRUIT INVESTIGATIONS

George F. Waldo, Corvallis, Oreg.

"Activities during the week have largely been concerned with a trip into western Washington to look over strawberry selections under test at Olympia, Puyallup, and Lynden, Wash.," he writes October 21. "The most outstanding selection probably was 1084 at Puyallup. Selections at Olympia were showing good growth. At Lynden, a large percentage of Washington certified Marshall strawberry plants are grown. Plants were very vigorous; growers are using the best possible methods for obtaining vigorous, healthy plants, and no disease was noted in the plantings visited."

"There is some acreage of Redheart in this vicinity but they do not seem to be as vigorous as the Marshall, although yields have been reported very good."

"The red raspberry acreage which had been reduced almost to nothing in Whatcom county due to winter injury on the Cuthbert is now coming back with new plantings of the Washington. Raspberry plants at Western Washington Experiment Station were very fine this year. Washington and Tahoma were among the best. Oregon selection No. 331 was also very vigorous, while much interest was expressed over Oregon 273 because of the fine quality of the fall fruiting berries."

John H. Weinberger, Fort Valley, Ga.

"According to the Agricultural Marketing Service report just released, Georgia shipped 4539 cars of peaches this past season, compared with a 7,000-car average for the past five years," he writes October 23d. "Fort Valley was the chief shipping point and Peach County the leading producing county. The principal crop reduction was with the Elberta variety, and Hiley suffered least from frost damage. Prices were higher than those of last year, with the exception of Early Rose, which variety sold for low prices both seasons, due to overlapping with the Early Hiley movement."

DECIDUOUS FRUIT INVESTIGATIONS

H. F. Bergman, East Wareham, Mass.

Writing from the Cranberry Disease Field Laboratory on October 13 he says: "All storage samples of cranberries from experimental spray plots, which have been picked, were screened this week. The amount of rot in berries from State Bog plots, even in those not sprayed, is very low so that any effect of spraying is not outstanding. Differences, however, are discernable and as the season advances these differences will undoubtedly become greater. The most striking example of the beneficial effects of spraying was found in berries from a series of plots on a bog at South Carver which had not been sprayed previously. The berries are the Black Veil variety and have always been of poor keeping quality. On September 7th when these berries were picked the amount of rot was relatively low being less than 10 percent on the worst unsprayed plot. In less than four weeks, however, the amount of rot had increased to 38-43 percent in berries from unsprayed plots but in berries from sprayed plots the amount of rot ranged from 4.0 to 6.3 percent. In this series of plots yellow copper oxide was definitely less effective than bordeaux 5-2-50 in checking spoilage. On the other bogs where yellow copper oxide was used it compared favorable with bordeaux 5-2-50.

"Harvesting has progressed rapidly and except for bogs owned or controlled by growers who have very large acreages, is complete. If favorable weather continues picking will be completed in another week which would make the finish about two weeks earlier than usual. Late berries have yielded somewhat better than the early ones so that the crop may exceed the 425,000 barrels estimated."

G. A. Meckstroth, Willard, N.C.

"I have been checking over the plants in our blueberry spraying experiment at Crabbe's," he writes from the Coastal Plain Station on November 4th. It is impossible to count the number of leaf spots and it was thought best to estimate the percent of leaf area killed. Our experiment consisted of two rows of 100 plants each to serve as checks, two rows that received dormant spray only, two rows dormant and summer spray, and two rows summer spray. The average percentage of leaf area killed in the check rows was 23.5 percent; that in the rows receiving the dormant spray was 19.9 percent; in the rows receiving dormant and summer spray, 1.8 percent; and in the rows receiving summer spray, 1.7 percent. These figures show that the rows receiving only the dormant spray were almost as bad, as far as leaf spot and mildew are concerned, as the check rows, and that rows receiving the summer spray were as good as those receiving the dormant plus the summer spray. In this experiment a 4-4-50 bordeaux with Lethane as spreader was used."

DECIDUOUS FRUIT INVESTIGATIONS

E. S. Dogman, Medford, Oreg.

"After the harvest was completed the following figures may be of interest even though they may vary slightly when the final check-up is made," he writes from the U. S. Pear Field Station on October 2d:

| Crop for the Medford District | | |
|-------------------------------|------------------------------|------------------------|
| | 1939 crop (approximately) | 9-year average 1930-38 |
| Bartlett..... | 850,000 boxes or 20,000 tons | 629,000 boxes |
| Anjou..... | 707,000 do | 440,000 do |
| Bosc..... | 475,000 do | 385,000 do |
| Comice..... | 80,000 do | 94,000 do |

"As far as the Experiment Station crop is concerned, the packed crop was 8.2 boxes per tree as against 7.7 boxes in 1938. In field lugs the yield was 12.1 lugs per tree in 1938 as against 11.5 lugs in 1939. (Cigars in separate envelope!) The better packout in 1939 was due primarily to lack of scab.

"Of course, the exceptionally large Anjou crop means that practically every Anjou tree in the valley had a crop. This was true for our non-pruned trees in block 4. The production of our pruning plots has been as follows:

| | Field lugs per tree | | | | |
|---------------|---------------------|------|------|------|------|
| | 1935 | 1936 | 1937 | 1938 | 1939 |
| Heavy..... | 9.3 | 10.3 | 6.0 | 13.1 | 11.7 |
| Moderate..... | 8.6 | 10.8 | 6.5 | 10.5 | 13.1 |
| No pruning... | 3.6 | 6.2 | 4.3 | 7.1 | 13.2 |

"It is not clear just what factors were involved in causing the heavy 'set' of Anjou this year."

R. B. Allyn, Medford, Oreg.

Reporting on the "duty of water investigations" for the period from October 7 to 21, he writes: "Computation of use of irrigation water by the frequently irrigated pear orchard plots of the station for 1938 to 193 indicate approximately 10 percent additional water used by the alfalfa cover cropped plots as against the summer clean cultivated plots. Moisture availability was not maintained quite as high throughout the season in the permanent alfalfa cover plots so that this percentage might be raised to 15 or slightly more for strictly comparative conditions. The alfalfa has made poor growth during this two year period although the stand has been fairly good."

DECIDUOUS FRUIT INVESTIGATIONS

Mr. R. B. Wilcox, Pemberton, N. J.

"The cranberry season was completed more than a week ago, most berries having been harvested before the heavy frost of the 16th," he writes from the Cranberry and Blueberry Disease Laboratory on October 28th. "Wherever water was available, bogs were flooded immediately after harvest, and the floaters have all been gathered and sent to the canneries. Flood waters have then been removed and many bogs have been given a light pruning to remove excessive runner growth. Most bogs that we have examined appear to be in good shape for the winter and for next season.

"The annual fall meeting of the Growers Cranberry Company, the largest selling organization in the State, was held on the 26th at Pemberton. Because of necessary outdoor work, we were unable to attend the meeting. The 1939 crop of New Jersey was placed officially at 70,000 barrels, which was considerably below the preliminary estimate. Some bogs approached their estimates very closely, while many others fell far short. The report was also made at the meeting that all of the frozen berries held by the canners from the crops of the preceding two years have now been used up, and that about 75,000 barrels of the present season's crop in Massachusetts and New Jersey will also be processed. The removal of these stored berries should leave the market in a strong position for next year.

"At the request of one grower, we have placed in the incubator a number of samples of Early Black and other varieties taken from their warehouse, to determine if possible whether these berries could be safely used for long shipments or whether some of them might better be sent to the canneries.

"The October meeting of the Ocean County Cranberry Club was held at Toms River on the evening of the 26th. Dr. Martin, Director of the New Jersey Experiment Station, and Mr. Doehlert were the speakers."

HANDLING, TRANSPORTATION AND STORAGE AND MARKET DISEASE INVESTIGATIONS

J. M. Lutz, Meridian, Miss.

Writing from the U. S. Horticultural Field Station on October 28th he says: "Sugar determinations on a number of tomato samples were made during the week. There was practically no change in the sugar content during the maturation of the fruit, the very immature fruit having practically the same sugar content as that allowed to ripen on the vine. Sucrose was present in extremely small quantities, most of the sugar being reducing sugars."

SUBTROPICAL FRUIT INVESTIGATIONS

C. S. Pomeroy, Riverside, Calif.

"As part of Dr. Aldrich's project covering factors affecting the set of fruit of the Washington Navel orange I have been studying such factors as pruning, ringing, leaf removal, pollination and the application of growth-promoting substances. Pruning studies were started in a block of 40-year-old trees on which individual-tree-production records had been secured for two seasons previous to pruning. Comparable studies were also started in another block of weaker trees, on which no previous individual-tree records are available. March and April pruning is being compared with that done in June and with no pruning. Careful root growth studies are also being made on certain of these trees. Box yields and also number of fruit per tree will be recorded at picking time. In general commercial practice very little pruning of oranges is now done, but it seems desirable to evaluate pruning as a possible means of increasing leaf growth and fruit set in old trees low in vigor. In addition to large plots in which the trunks were girdled (in April 1939) as is sometimes done on a commercial basis, a series of limbs on other trees were treated in October 1938 to study the fruit set in 1939 as influenced by ringing, partial defoliation (removing about three-fourths of the leaves), or ringing combined with partial defoliation the previous fall--as follows, October 1938:

| Treatment - Small limbs on 12 trees | Leaves per limb after treatment | Leaves per fruit | Flowers per limb | Fruits per limb | Percent blossoms setting fruit |
|---|---------------------------------------|------------------------|------------------------|-----------------------|---|
| Check..... | 1963 | 75 | 464 | 19 | 4.1 |
| Ringed..... | 2117 | 72 | 763 | 29 | 3.8 |
| Partially defoliated | 408 | 19 | 83 | 0.7 | 0.8 |
| Ringed and partially defoliated..... | 421 | 18 | 30 | 1.7 | 5.7 |

"Ringing alone apparently caused an increase in the relative number of flowers and fruits set but the percent of set compared with the number of flowers produced remained practically unchanged. Partial defoliation greatly reduced the number of flowers and fruits, several limbs having no fruits at all. Ringing combined with partial defoliation still further reduced flower production and more of the limbs were entirely barren of fruit but the percent of fruit as compared to the flowers produced was greater than for the limbs that were partially defoliated and not ringed. The effect of the various growth-promoting substances on the blossoms and small fruits of the current crops has been studied using both aqueous solutions and applications of lanoline. Most of these tests were very indeterminate as is shown in the following tabulation of a typical series, but results in some cases indicated the advisability of extending these studies during another season.

Growth-promoting substance on Washington Navel orange; one large flower-bud selected from a cluster, petals removed, style broken, and sprayed with 0.1 percent solution, distilled water being used on checks--summary below shows percentage of set on August 3, 1939:

| | | | |
|------------------------|-------------------------------|------|---------|
| "160 sets on 13 trees | (Naphthalene acetic acid..... | 18.8 | percent |
| treated April 20,..... | (Indole acetic acid..... | 15.0 | " |
| and 21 | (Indole butyric acid..... | 12.5 | " |
| | (Check..... | 15.0 | " |
| "50 sets on 4 weaker | (Calcium furate..... | 2.0 | " |
| trees, treated..... | (Furacrylic acid..... | 0.0 | " |
| May 4. | (Check..... | 4.0 | " |

"A trial of the effect of growth-promoting substances on a non-fruiting strain of Lantana sellowiana (Link and Otto) which is widely grown in Southern California as an ornamental ground cover, showed its value as an indicator of the general effectiveness of these substances. Open flowers and large buds were pulled from the clusters and the partially exposed ovaries were sprayed with 0.1 percent aqueous solutions. On thousands of untreated checks not a single fruit has been set. In one test the flowers and buds were not removed from the cluster and naphthalene acetic acid was sprayed directly onto them, but no fruits developed for that treatment.

| "Growth-promoting substances on <u>Lantana sellowiana</u> | Number of ovaries treated. | Fruit set after one month. |
|--|-------------------------------|-------------------------------|
| 1938 Naphthalene acetic acid..... | 352 | 42.9 percent |
| 1939 Naphthalene acetic acid..... | 187 | 56.7 " |
| (Solution 1 year old)..... | 216 | 13.9 " |
| Indole acetic acid..... | 64 | 18.8 " |
| Indole butyric acid..... | 112 | 51.8 " |
| Calcium furate..... | 110 | 0.0 " |
| Furacrylic acid..... | 579 | 0.0 " |

"With the thought that the pollen of citrus varieties that produce many seeds probably contains a relative abundance of growth-promoting substances, a series of pollinations was made on Washington Navel flowers which normally produce no pollen. Included in the test was Fard date pollen, which has been found by F. E. Gardner to have an active supply of auxin:

| Pollen used | Buds treated | Fruit set Aug. 3 |
|--------------------------|--------------|------------------|
| "St. Michael orange..... | 211 | 37.0 percent |
| Meyer lemon..... | 211 | 35.5 " |
| Colman citrange..... | 76 | 38.2 " |
| Shaddock..... | 135 | 40.0 " |
| Checks..... | 211 | 35.1 " |
| (Fard date..... | 58 | 46.6 " |
| (Check..... | 58 | 34.5 " |

"The results obtained in set of fruit were entirely indeterminate and within the limits of normal variability, except that the Fard date pollen appeared to appreciably increase fruit set."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

George P. Hoffman

"Forest fires in the station farm area have given us much concern during this fall," he writes October 28th. "Fence rows, ditch banks and areas about orchard trees have been cleared....Never before have crows been so numerous on the station farm. They are apparently feasting from the few pecans (here and there on the trees) and the cover crop.

"Considerable time was devoted to sweetpotato data work. Some time was given our sweetpotato seedlings, and that some of these promise to be highly vegetative is well illustrated in vine weighings made from three plants which averaged 24 pounds of vine per plant with no roots of edible size and quality.

"One more week will finish asparagus cutting for this season. There is little question but that quality asparagus can be produced and cut during the fall months in this and sections having similar climatic conditions. However, moisture seems to be the limiting factor both in quality and economical yields.

"Previously referred to fall tomatoes which were set deep--plants 12 to 16 inches long from which the lower leaves were removed within 3 to 4 leaves of the top of the plant and set in a 8-12 inch hold made with a post-hole digger--have withstood the drought while shallow-set plants have been dead from three to five weeks. Deep setting of tomatoes might rightly seem of impractical use to the commercial or large grower but for the local market and house gardener, this is a worthwhile and practical method by which tomatoes might be grown during the fall months in areas where moisture is a limiting factor."

He had written October 21: "It is interesting to observe that the heavy vining sweetpotato varieties (such as Triumph and Porto Rico) and seedlings of similar vine growth habit are suffering much less from moisture shortage than are light vining varieties (such as Nancy Hall and Vine-land Bush) and seedlings of similar vine growth habit. Previous observations on heavy vining varieties suggest that such varieties are better adapted and are more at home on the heavier soil types and that the characteristic and/or predominating root shape and development tends toward length rather than breadth. This apparent habit of 'tuberous' root shape and development is very much less conspicuous in the light vining varieties, which seem to be more at home on the lighter soil types of optimum moisture, as the 'tuberous' roots tend to be round and/or chunky.

"Interested visitors continue to visit the station and express themselves as being favorably impressed."

ADMINISTRATIVE NOTES

Toll Charges: The News Letter for March 15, 1939, page 72, carried a paragraph regarding identification forms necessary for Government employees to secure free passage over the San Francisco-Oakland Bay bridge when traveling on official business. We are now informed that Commander Colin Campbell, U. S. Navy, District Staff Headquarters, 12th Naval District, Federal Office Building, San Francisco, California has been made the Department's representative in connection with obtaining passes over this bridge, etc. He succeeds Dr. L. I. Hewes.

All employees interested should apply to Commander Campbell for information in regard to the procedure to be followed in connection with official travel over the bridge. This is important because the pass form previously used is no longer accepted by the Bridge Authority; a new form has been issued. Also there is a reduced toll charge for those who are not entitled to free passage over the bridge.

Employees who are likely to travel over this bridge officially should be sure to get in touch with Commander Campbell promptly and learn about correct procedure, pass forms and the like. Don't put it off, like your Christmas shopping, until the last minute; until you can see the whites of the toll collector's eyes!

A CORRESPONDENCE COURSE IN ELEMENTARY STATISTICS FOR FIELD WORKERS

The Department's Graduate School at Washington, D. C. in response to various inquiries, is considering the possibility of offering field workers a correspondence course in elementary statistical methods in biology and plant and animal industries. The course considered would lead up to the treatments given in textbooks, making possible their more intelligent use. A well-known textbook would be used as a guide. This is not designed as a college credit course, but a certificate would be awarded for satisfactory completion.

The tentative plan contemplates 15 to 18 assignments, requiring on the average 5 or 6 hours each. Study assignments would be followed by answering questions and working practical problems, which would constitute the student's report. Opportunity for discussion of the student's own problems would be given. The total expense would probably not be over \$25, which would include the price of the textbook, fees, and postage on assignments.

Those interested should write to Dr. A. F. Woods, Graduate School, U. S. Department of Agriculture, Washington, D. C.

Vol. 11 No. 22

November 15, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI

U. S. Horticultural Station, Beltsville, Md.
December 1, 1939.

No. 23

Better Food The News Letter for June 15, 1939, quoted a few paragraphs from Dr. Auchter's address as retiring vice-president and chairman of Section O(Agriculture) of the American Association for the Advancement of Science, at Richmond, Va., the latter part of December, 1938. The address appears in full in Science for May 12, 1939. Dr. Auchter pointed out the responsibility of the agricultural research worker to further the production of foods of the highest nutritional quality.

It is interesting in this connection to learn that this has been made the definite objective of an important new research project, nominally under the Bureau of Plant Industry, but including cooperation with other Bureaus and State agricultural experiment stations. Cornell University, in fact, has provided the land and certain other facilities for the construction of laboratories and greenhouses to be used in connection with the new studies; and Dr. L. A. Maynard of Cornell has been appointed Director of the Laboratory.

"Work at the new laboratory is expected to develop facts that will enable practices in soil management and crop production to be dovetailed more closely with human nutritional needs," said the Secretary in an announcement given to the newspapers early in November. "Agricultural scientists have done a good job in solving problems of quantity production and market quality. Today, new advances in the science of nutrition make it necessary to think about doing an equally good job on quality production as it relates to nutritional value. One of the early steps will be a survey of mineral resources in the soils of the United States--not the minerals that are used as precious metals or industrial materials, but the vital elements that human beings must get from foods, which in turn get them from the soil.

"Do the soils in all areas furnish all the elements needed for the successful production of plants and thus indirectly the health of the human beings and animals that eat them? We know that in some cases they do not. Plants in some soil areas develop abnormally because of certain soil deficiencies. Likewise serious phosphorus deficiencies in some areas affect the health of livestock. Cattle cannot get enough phosphorus from the plants grown on these soils to make sound bones or meet their other body needs. Sometimes you see cows instinctively trying to make up for the deficiency by gnawing bones and other refuse as dogs do.

"In certain areas grazing animals waste away and die because of a lack of cobalt in the soil and forage, though the animal's daily need could be held on the head of a pin. Amazing recoveries result from adding small amounts of cobalt to the soil.

"This is a striking case. Others are much less obvious. More is being learned every day about deficiencies of certain rare or trace elements in soils. It is now known that plants need some of these elements in very minute amounts just as human beings need iron and vitamins in relatively minute amounts. Sometimes a little too much will actually kill the plant. But if it does not get what it needs it will suffer from some nutritional disease as real and serious as rickets, pellagra, or anemia in humans.

"We know very little about these variations in soils, and especially about what they mean in terms of human nutrition; but we are beginning to suspect that they may mean a great deal. There are a lot of other factors, too. For example, some varieties of a plant furnish more of a valuable nutritive element than other varieties of the same plant. Yet there has been practically no effort to breed plants that would be superior from this standpoint; in fact, we sometimes develop varieties that are nice looking but inferior nutritionally. Again, a product harvested at one stage of development will be richer in certain nutrients than if it were harvested at another stage. And so on.

"One of the great difficulties in working with such problems in the past has been the lack of methods refined enough to detect the minute quantities of some vital minerals in soils and in plant and animal tissues--minute quantities that mean the difference between sickness and health, or even life and death. New developments with the spectrograph and the polarigraph are rapidly removing this difficulty... The time is ripe for beginning a system of study that will start with the soil and go right through to man. Only a few of the possibilities of this study have been suggested. Hitherto agriculture has been almost entirely concerned with the technical problems of quantity production, fighting diseases and insects, and certain quality factors that have to do with processing, shipping, and appearance on the market. But food is produced for nourishment. There is promise that a great deal for human welfare can be accomplished by paying more attention to nutritive values in research on production."

NUT INVESTIGATIONS

E. K. Dodge, Sareveport, La.

"Work this week has consisted of harvesting 8200 pounds of pecans and getting nut size data from the experimental plots," he writes November 4th. "This brings the total harvest weight of the crop this season to more than 15,000 pounds. We have some more yet to harvest so that the total crop this year will amount to 14,000 pounds. The crop would, of course, lose about 2,000 pounds in curing; making an orchard run marketable crop of 12,000 pounds. This is the best crop ever harvested at this station.

"Success nuts this year are much longer than usual. In fact, they even look to be 'off type.'

"The field differences in all cases this year are greater than had been anticipated. Yields from Bermuda plots are so low that we can almost say there are none. Rye as a cover crop has reduced the yields more than ever, velvet beans have reduced it less than rye has, but the reduction here has amounted to more than 50 percent. Cotton and late cultivation have both reduced the crop slightly.

"The crop on the Caspians trees was harvested this week with more than 49 pounds per tree from the bordeaux sprayed trees, and less than 15 pounds per tree from the unsprayed trees. This makes 3 varieties that have shown significant increases in yields this season resulting from bordeaux spraying."

J. E. Schuster, Corvallis, Oreg.

"Walnut harvest is over and the packing is well along," he writes November 10th. "To everybody's surprise the quality of the walnut kernels has been unusually good, but the quality of the shell has not been so good. The report from the packing houses indicates a greater amount of breakage than ever before and also in some districts there is an excessive amount of red nuts. Also, the nuts remained in the husk on the trees after the husks were cracked without a rain, and when the rain came the nuts fell badly discolored. The problem has been to bleach them satisfactorily so they would be classed as No. 1 nuts."

Joan R. Cole, Albany, Ga.

Writing from the U. S. Pecan Disease Field Laboratory on November 11 he says: "Friday I examined plots of Schley trees in the Taylor orchard that were sprayed three times with 1-50 copper sulphate, also 1-50 calcium hydroxide. The foliage on the trees sprayed with the copper sulphate was in a vigorous condition, similar to that foliage on trees sprayed with bordeaux mixture, while the foliage had been shed prematurely on those trees that were sprayed with the calcium hydroxide."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

"We think we have established a record yield for a 16-year-old Schley tree," he writes November 11th from the U. S. Pecan Field Station and Laboratory. "This tree, planted in the spring of 1924, yielded 163.2 pounds of excellent nuts. Several other trees produced well over 100 pounds each and most rows averaged better than 50 pounds per tree. In size, the Schley nuts are averaging about 45 percent medium and 45 percent large. However, based on the number of nuts per pound, the sizes would be classed as just over the line in large and extra large, indicating the excellent degree of filling."

George F. Potter, Bogalusa, La. (Tung Investigations)

"Mr. Hines has continued his work with the crotch canker disease mentioned in our last report, endeavoring to obtain the causal organism in pure culture," he writes November 4th. "He has a bacterium isolated which grows freely on potato dextrose and forms gas generously. Circumstantially, at least, this would appear to be the right one, for gas is formed so freely in the cankers on the trees that they are constantly covered with foam. If the foam is wiped away, it instantly commences to bubble out again from the bark or wood. The organism has not as yet been stained but it is evident that it is rod shaped. In addition some excellent fruiting bodies of the common rootrot were found and cultures have been made from these for further study."

Paul W. Miller, Corvallis, Oreg.

"The walnut crop has now been harvested," he reports November 4th. "Although no definite figures are as yet available, it is quite evident that the crop will not run much over 50 percent of the bumper crop of 1938. Contrary to expectations, the quality of the crop is, in general, very good."

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Wilcox, Pemberton, N.J.

"Cranberry sorting and shipment have been proceeding rapidly," he reports November 18th. "Practically all of the early berries and those intended for the Thanksgiving market have now been disposed of, only the later and better keeping fruit being left in warehouses. Many growers have been lightly raking their bogs since completion of harvest in order to remove excessive runner growth and leave the vines in better condition for another year. Some sanding is being done. A number of growers, who have no reservoirs, have closed their lower gates so as to start collecting winter flood. Other bogs have not yet been put under water....A very few blueberry growers have started pruning their bushes but most of this work will not get under way until the first of December."

DECIDUOUS FRUIT INVESTIGATIONS

G. A. Meckstroth, Willard, N. C.

Writing from the Coastal Plain Station on November 18th he says: "Last week I visited the blueberry farms belonging to Double Trouble Company, Magnolia, N. C.; F. Coville and H. G. Huntington, Atkinson, N.C., and G. Harrison, Ivanhoe, N. C., in company with Messrs. E. B. Morrow and B. B. Fulton. Dr. Fulton came down to look into the blueberry mite problem and is planning some experimental work in cooperation with the growers on the control of this mite. The mite in question has been identified as Eriophyes vaccinii by Dr. Kiefer, a species new to science. Other closely related mites are being controlled by dormant sprays of lime sulphur or oil and Dr. Fulton is of the opinion that control of this mite may be secured by using these materials. The insect has built up with alarming rapidity in the last two or three years and the growers are very much concerned over it.

"I have been making observations on all the blueberry varieties in the field and nursery on the farm of Mr. G. Harrison, Ivanhoe, N. C. in an attempt to study the variation of different varieties in their susceptibility to rust, mildew and leaf spot. I have found rust very bad on Harding and Grover; bad on Jersey, Rubel and Adams; moderate on Sam and Stanley; slight on Cabot, and none on Rancocas, Pioneer, June, Weymouth and Dixi. Powdery mildew is very bad on Pioneer; moderate on Jersey, Sam and Stanley; slight on Rubel, Concord and Adams; and only a trace on Rancocoas, June, Grover, Weymouth, Dixi and Harding. Leaf spot is bad on Cabot, Rancocas, Pioneer and Dixi; moderate on Jersey, Concord, Adams and Weymouth; slight on Rubel and Sam, and only a trace on Stanley, June, Grover and Harding. I have not found the blueberry canker disease in Mr. Harrison's field at all. This is a young field which was put out a year ago last spring."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

George P. Hoffman (Vegetable Crops)

"The County Agent's Coordinating Council of State and Federal agencies in Lauderdale County, of which our station has been designated as a member organization, met with us Monday afternoon of this week," he writes November 11th. "The interrelation of the activities of the several groups was discussed, and the work of our group presented so that the other members present could be made more familiar with it....Friday morning a group of vocational agricultural students from a nearby high school, under the supervision of their instructor, Mr. H. L. Davis, made a tour of the station.

"There have been a number of woods fires near the station this week, resulting probably from carelessness of hunters and other people in the woods, and helped along by the extreme dry weather. One fire directly across the road was put out by station staff members working from 11:30 one night to 2:30 in the morning."

SUBTROPICAL FRUIT INVESTIGATIONS

W. W. Aldrich, Indio, Calif.

Writing from the U. S. Date Research Garden, he gives us some more details on rainfall damage at Indio and vicinity. "A 3.15 inch rainfall in the Indio area on September 4 and 5, followed by six days of high humidity with a few light showers, resulted in serious injury to the commercial date crop and to our research program. A 6.45-inch rain during seven hours on September 24, injured additional date fruits in some plantings. Since average rainfall for September, based on previous 61 years, is only 0.2 inches, conditions this year are abnormal; and therefore the responses of all plants in our experimental plots must likewise be considered abnormal. Date varieties which normally show considerable shrivel during ripening had an abnormally high water content. Many varieties of soft dates ripened without the usual flavor, and soured either before or after storage. Our papayas increased in height about one foot per week and started setting fruit early in September. Summer cover crops planted September 1st did not grow while many fall cover crops planted at the same time showed growth not ordinarily expected in September.

"Injury to the date fruit as a result of this weather was of three general types - (1) cracking and splitting of skin of such varieties as Deglet Noor, Iteema, Zahidi, Barakawi (a dry date), and Barhee; (2) invasions of fruit through openings in skin or through loosened perianth by *Alternaria*, *Aspergillus* or other fungus, particularly for such varieties as Deglet Noor and Saigy; (3) excessive hydration of fruit, followed by premature softening and extensive souring and sudden dropping, most serious for such varieties as Khadrawy, Sayer, Maktoom, Zahidi, Khalasa and Thoory. Whereas no variety was immune from one or more of these three types of injury, Khalasa, Halawy, Zahidi, and Thoory were, in general, less affected than other imported varieties. One seedling from the old Reed Garden seemed particularly resistant also. Although Dayri showed considerable cracking, the only fruit available for observation was on young palms with very few fruits per bunch. For Deglet Noor, comprising about 85 percent of the commercial planting, splitting or cracking of the skin immediately injured from 5 to 50 percent of the fruit. This type of injury seemed to be worse for fruits at the stage of tip-softening, and least severe on large bunches of small fruit. Bunches covered by paper bags showed appreciably less injury than fruit covered by cloth bags or without any covering. The splitting and cracking was followed by invasion by fungi. Many fruits not split or cracked were either invaded by fungi or became discolored (darkened) at tip. It is now feared that the commercial production this year will be reduced over 50 percent and that for the fruit packed the grade will be poorer than usual.

"Saigy fruit, which during ripening normally loosens sufficiently at the perianth to permit entrance of fungi and insects, was almost completely ruined by this type of injury this year. Khadrawy hydrated by the abnormally wet weather softened with very poor flavor. Halawy,

SUBTROPICAL FRUIT INVESTIGATIONS

W. W. Aldrich (continued)

usually subject to shrivel during ripening, was hydrated without much loss of flavor; but souring caused considerable loss. Zahidi, normally a semi-dry date with little flavor, ripened as a much softer day and with improved flavor; but cracking and extensive dropping reduced yield appreciably. Thoory was similarly affected.

In the Salt River Valley (around Phoenix, Ariz.) there was (according to Mr. R. H. Hilgeman of the University of Arizona date garden) about 2-1/2 inches of rain in September and a large number of humid days. This caused excessive cracking of Iteema and Maktoom, premature softening of Khadrawy and considerable souring of all varieties. Even under these wet conditions, however, both Maktoom and Dayri showed considerable premature shriveling.

"Of particular interest this year is the fact that the wet weather in September did not prevent extensive ripe shrivel of Deglet Noor. The second, and principal, picking (on September 20) in the irrigation plots at the station showed the following percentages of fruit in each of the three grades being picked at that time:

| Grade | Dry (Water deficit in June and July with leaf elongation reduced about 40 percent.) | Wet (Irrigated weekly.) |
|--|--|-------------------------------|
| | Percent | Percent |
| B-1 (Fancy and Star-Choice Grades) | 0 | 21 |
| B-2 (Choice and Standard Grades) | 55 | 60 |
| D (Shriveled fruit for By-Products) | 45 | 19 |

"The prevention of water deficits in June and July not only reduced the percentage of shrivel but resulted in a lighter, more amber, color of the fruit. It is this amber color that is desired for fancy packs. We have not made the principal picking in the Cavanagh plots, where water deficits of similar intensity were permitted for only three weeks."

LETTER WRITING

"Cumulatively, the steady flow of correspondence to the public establishes the personality of the Bureau, and consistently builds up either friendliness or antagonisms," says Dr. Auchter in B.P.I. Memo, 1072 of November 6, 1959, transmitting to heads of divisions suggestions from Mr. Paul H. Appleby, Assistant to the Secretary, concerning the preparation of letters for the signature of the Secretary. "A citizen writing to the Government clearly has a right to expect as helpful a reply as may be practicable, courteously expressed. It is our responsibility, therefore, to give effective courteous response. Anything less may quickly react against us as individuals and against the Bureau and the Department. Even though incoming correspondence may at times appear burdensome, or individual letters irritating, we should not permit personal reactions to be reflected in our replies. The uniform spirit of helpfulness and courtesy which has characterized the Bureau in its relations with the public during its entire history should be faithfully preserved."

The standards used in reviewing correspondence prepared for the signature of the Secretary will be helpful to all who write official letters. Questions such as the following are used in determining whether or not a letter is acceptable: (1) Is the factual information accurate? (2) Are the policies or procedures involved in accordance with the regulations and orders of the Department? (3) Is the letter complete? (4) Is it free from errors in grammar, spelling, punctuation and typing? (5) Is it neat and arranged in proper form? (6) Is the language appropriate? (7) Are the ideas presented logically so the meaning cannot be misunderstood? (8) Is the letter direct and to the point without being abrupt? (9) Is the tone informal, sincere, courteous and cooperative?

"An appropriate tone in a letter depends upon the circumstances in each case," says Mr. Appleby. "Informality and naturalness are appropriate in letters signed by the Secretary. The use of the first person instead of the third will improve the letters in this respect. Poor tone results from the use of high-sounding words; indirect or uncomplimentary references; sarcastic, arbitrary or unsympathetic statements; trite expressions; excess formality; and insincerity.

"Statements such as 'You made a mistake,' 'You misunderstood,' 'We must impress upon you,' 'You claim,' 'You must comply with these instructions,' and 'Account for this discrepancy' should not appear in Department letters, as they tend to antagonize the addressee and to destroy instead of create good will. Technical, scientific, statistical, medical or other terms unfamiliar to the general public should be avoided if possible. If a technical term is used, its meaning must be clear or it should be explained parenthetically. There is often a simpler word which can be substituted. Department letters should be free from repetition, irrelevant material, complicated sentences, inexact expressions, and formal and stereotyped phrases."

Following are some of the expressions Mr. Appleby believes should be avoided in our letters: "Duly received" for "received"; "Your kind favor" for "your letter"; "Beg to advise (hand, or remain)" should be omitted, as should "We wish to advise that," "Please be advised (informed) that," "You are advised (informed) that," "Instant, ultimo, proximo," "As of even date," "Under date of," "And oblige," "Govern yourself accordingly," "Permit me to say (state, or explain)," and "I am (or we are) taking the liberty of." "Enclosed herewith" should not be used for "Enclosed," "You will please find attached hereto," for "attached is," or "As per statement attached hereto" for "as shown by the attached statement." Use "We have," instead of "We are in receipt of," "since," for "In view of the fact," and "I regret that," instead of "I regret to state that." "Contact," he points out, when used to denote the establishment of business or social connection is slang.

"Vague words which can easily be misinterpreted should not be used. To be clear, a letter must be definite. The use of indefinite words or phrases like 'matter,' 'handle,' 'along this line,' and 'in due course,' should ordinarily be avoided. A 'person' should not be referred to as a 'party.' Insofar as this is permissible at any time, it is legal phraseology, and phraseology that is especially legal is as much to be avoided in general correspondence as is language that is scientifically specialized.

"When possible, letters should open with the information requested or furnished. If the purpose of the letter is expressed in the opening paragraph there is no need for preliminary comments such as 'Reference is made,' 'Your attention is directed,' or 'Receipt is acknowledged.'"

"A reference to the incoming letter should ordinarily be subordinated. However, there are cases where it is desirable for the opening paragraph to consist in merely an acknowledgement of the incoming letter and an identification of the subject matter. Acceptable 'acknowledgment' openings which might be used are 'This is in reply to your letter,' 'This will acknowledge your letter,' 'This refers to your letter,' or 'I (or we) have your letter.' Incoming letters should not be paraphrased at length. Usually a line or two for identification is sufficient. It is usually helpful to the recipient if a reply does refer to the date of the incoming letter....

"The closing paragraph of a letter is particularly important because it leaves the final impression. Simple, direct statements such as 'Thank you for interest' are desirable. Please note particularly that our letters should be responsive to the closing paragraph of incoming letters. When other officials of the government close letters to the Secretary on a personal note such as 'with good wishes' or 'with personal regards' the reply should be equally courteous. The closing 'with kind regards' should not be used. It is all right for someone else to say that one is kind, but one should not claim kindness for himself."

CHEYENNE HORTICULTURAL FIELD STATION, CHEYENNE, WYO.

Drs. Hildreth, Powers, and Benedict returned to the station on October 25th from a trip of 2 weeks duration through New Mexico, Arizona, and Utah. Collections of seed from high elevations and arid regions were made. These include 20 muskmelons, 15 watermelons, 3 squash and several samples of mixed beans and peas. These crops have been grown many years by Indians and Spanish settlers of that region and should be adapted by natural selection to much of the central plains and mountain country in this region. In addition, collections were made of 53 native species thought to be useful for ornamental purposes. These include 30 species of trees and shrubs and 23 species of perennials.

Dr. Benedict gathered about 100 collections of grass seed from locations of varying elevations. He visited the Soil Conservation nursery at Tucson, Ariz., and talked over problems of species best adapted to that section of the country, and problems involved in growing species for seed and talked with several Indian agents regarding forage problems in their respective areas.

Mr. Krofchek returned to the station on October 23d from a week's trip through the southern and central portions of Wyoming where he inspected cooperative windbreak, fruit and ornamental plantings, and also looked over prospective cooperative sites. Tree plantings were inspected in Platte, Converse, and Sweetwater counties and a prospective cooperator's site was inspected near Rock Springs in Sweetwater county. While in that portion of the State he did some scouting for box elder seed in the Red Desert. Fruit and ornamental cooperative plantings were inspected at the Wind River Indian Agency, Fort Washakie, Wyo., an ornamental planting at the Forest Service garage at Lander, both ornamental and fruit at the State Farm, Evans-ton, and at the State Experiment Station at Lyman.

ADMINISTRATIVE NOTE

Renting. The General Accounting Office has ruled, Decision A-97514-S, that contracts for the rental of trucks, construction equipment, and personal property generally, with or without operator, are not contracts "for the manufacture or furnishing of materials, supplies, articles and equipment" and therefore the labor, etc. stipulations of the Walsh-Neely Act of June 30, 1936 (49 Stat. 2036) are not for inclusion therein, the word "furnishing" as used in the act contemplating the "selling" of property to the Government takes title to, as well as possession of, the article or thing involved.

 COMPENSATION COMMISSION

Injuries: The question has recently been raised concerning the use of
Sick and sick and annual leave in the event a Federal employee is in-
Annual jured in the performance of his official duties. When an
Leave employee is partially or totally disabled as a result of in-
 jury sustained in the performance of duty, it is optional
 with him whether he exhausts his sick and annual leave before claiming
 compensation from the United States Employee's Compensation Commission.
 As far as the Compensation Commission is concerned, it is optional with
 the injured employee whether he exhaust his sick and annual leave before
 going on the Compensation rolls. However, if he has exhausted his sick
 and annual leave and then is put on the Compensation rolls, three days
 must be lost before he can receive pay from the Commission; and thereafter
 receive, at the most, only two-thirds of his regular pay for total disability
 period. On the other hand, it might be desirable to retain some leave for
 other purposes. However, it is up to the employee to make his choice, pro-
 vided, of course, it meets with the approval of his official superior.

Injury sus- This is another question that occasionally comes up and
tained going which we feel should be brought to the attention of all
to or return- Division employees. A personal injury sustained by a
ing from work civil employee of the United States while on the premi-
 ses of employment for the purpose of going to or return-
 ing from his work or performing duties connected with or incidental to
 his work, and not while the employee is there merely for some personal
 reason, may be considered an injury sustained "while in the performance
 of duty." A full and complete statement of all facts should accompany
 the report of an injury sustained under such circumstances, in order
 that the Commission may determine the right of the injured employee to
 the benefits of the Compensation Act.

Please attach these paragraphs to your mimeographed instructions
 concerning procedure in connection with Employee's Compensation Commis-
 sion claims, for your future guidance.

Plant Approval of papers for publication in the Plant Disease
Disease Reporter should now be requested on the new form, somewhat
Reporter similar to that used for outside publication, to be ob-
 tained from the office of the Assistant Chief of Bureau
 (Room 210, West Wing). Submit an original, one green, and two white
 carbon copies, one of the carbon copies being needed for Mr. Gilbert's
 "follow-up" file. One carbon copy of the MS only is needed.

Christmas For the benefit of those who came in late, we wish to add that
Mailings the Post Office Department would appreciate it if bulk mailings
 are withheld from December 10 to 26. Large packages not only
 interfere with the expeditions handling of the holiday mails but, because
 of their weight, may cause damage to Christmas parcels.

Vol. 11 No. 23

December 1, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY NEWS LETTER

The official organ of the Division of Fruit and Vegetable Crops and Diseases; Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature and is not to be published without obtaining the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. XI U. S. Horticultural Station, Beltsville, Md. No. 24
December 15, 1939.

We "dedicate" "Production Sections of the Division deal, essentially, a building!" with the relation of environment to growth; the Section of Handling, Transportation, Storage and Market Disease Investigations is concerned primarily with the relation of environment to disintegration, determining what changes occur after a product is grown and harvested, and how the processes of disintegration can be arrested or controlled," said Mr. D. F. Fisher during a Seminar talk the afternoon of November 21, 1939, when a tour was made of the new cold storage laboratory provided for his section at Beltsville. Since the editor makes it a practice to go to bed before midnight, he had to leave before all of the visitors, who arrived at 3:30 p.m., had completed their tour of inspection. Mr. Fisher had explained that the work of his section began on the farm and extended into the home of the consumer--and some of the visitors quite evidently wanted to be shown! Well, they were shown that is probably the best equipped cold storage laboratory in the world--or am I being too conservative?

The structure is now officially designated as "Building No. 5," but the authority for putting it up listed it as an "experimental fruit and vegetable cold storage research and horticultural manufacturers laboratory," which gives an idea of the use for which it is intended. Besides housing Mr. Fisher's group, it also takes care at present of Mr. Gould's Staff and the Division's Business Office.

The building is of Georgian Colonial architecture, 77 x 120 feet, and three stories high, of reinforced concrete and brick construction, with limestone trim. There are 22 rooms equipped for temperature-control studies, each having a capacity of about half a carload. They are plastered with "Enamelite", suitably insulated with sheet cork, and finished with aluminum paint to keep down mold growth. The fruit and vegetable washing and packing equipment and other installations to make the building "the national center for cold storage research of the Department" will be along later

The plant is designed to maintain and control any desired temperature within the range of -15° to $+110^{\circ}$ F. The equipment includes three 9-ton Baker ammonia compressors, two shell and tube condensers, two brine tanks with evaporative coils, and one tank for mixing low-temperature brine with the return brine. This provides brine with three different ranges of temperature for maintenance of desired temperatures in the storage rooms. Flexibility in the brine temperatures available, and the large coil surface provided in each room permit the storage to be operated with a differential of only 5° between the temperature of the brine and that of the air in the coldest rooms, thus enabling high atmospheric humidity to be maintained even at low temperatures. Each tank has duplicate brine pumps. A brine heater and necessary circulating pump are also provided for defrosting.

There are--excuse the technicalities, but this part is largely for Ed Smith and the boys on the Coast who wouldn't believe it unless they saw it in type--well, two of the compressors are at all times cut in for operation, the third being a standby for emergency use. Operation of each compressor is controlled by two thermostates in the brine tank. These thermostates are set at two different temperatures so that they operate their respective compressors at high or low speed, or cut them out completely, depending on the temperature of the brine. In the brine line to the mixing tank there is a thermostatic temperature-regulating valve that feeds the cold brine into the mixing tank according to the demands of the thermostat. Safety provisions include both high- and low-pressure cut-outs on the compressors and alarms or signal devices on different parts of the system, so even Eddie Gorman is in no danger. In case of trouble, you see, the machinery is stopped automatically but it must be started manually after correction of the trouble.

Wet- and dry-bulb temperatures in each cold storage room are continuously recorded by 22 Brown Instrument Company controlling-recorders mounted on a panel board in the compressor room. The temperature in each room is controlled by these instruments which automatically operate electro-pneumatic throttling valves in the brine line. In the higher temperature rooms both unit coolers and electric heaters are installed, with thermostatic control on the latter, the recording and controlling instruments being located on the wall outside of each room. A ripening room is provided in which both temperature and humidity are automatically maintained. This temperature set-up is so amazingly perfect that Mr. Fisher has a terrible time getting Claude Wright to go home.

As you have perhaps suspected but never known definitely until now, the organization of research activities in the Department is not upon a functional basis but rather upon the basis of application in broad agricultural fields and so we find that the work on refrigeration is not directed primarily to refrigeration as such but to its application in the several fields of agricultural research, with Mr. Fisher's section concerned with its application to horticultural products.

Fourteen specialists have headquarters here and devote all of their time to intensive studies on the handling, transportation, and storage of horticultural crops--including investigations of market diseases. In addition to the new facilities at Beltsville, Mr. Fisher's section has nine field laboratories with 22 scientific employees doing similar work in different parts of the country. At these field laboratories, of course, the work is more or less specialized on the crops of the region, being directed particularly to current problems of the industry. Because of its fine equipment, however, the headquarters laboratory at Beltsville is relied upon for much of the fundamental research applicable generally throughout the country. However, work will also be done on current problems of the industry in the Atlantic Seaboard area the same as is being done by the various field laboratories in other parts of the country. The laboratories formerly located at Arlington Experimental Farm, have all been transferred to the new location Beltsville, so that for the first time offices and central laboratories are under one roof.

The new cold storage laboratory at Beltsville will thus serve as headquarters for all field work at the nine different stations established in the principal producing areas, and the two principal terminal markets of the country, with seasonal field work here and there--mostly there. It makes it possible to conduct experimental work without fear of premature exploitation though, of course, it has the disadvantage of being isolated from commercial producing sections--that is when we have something to demonstrate there is no nearby industry to observe it, necessitating dependence on bulletins--never as effective as personal contact, i.e. the laboratory method.

Speaking of the section's publications, one of the latest, Miscellaneous Publication No. 540, "Market Diseases of Fruits and Vegetables: Grapes and Other Small Fruits," by Dean H. Rose, C. O. Bratton, and W. E. Pentzer, is proving so popular that we have had nearly 600 requests for copies during the past two months--107 on November 27th alone. Unfortunately, the color plates, necessary for an adequate picturing of the diseases and blenishes described, so add to the cost of printing that it is not possible to distribute the publication free--the Superintendent of Documents, Government Printing Office, Washington, D. C. estimates the cost of printing and handling at 40 cents a copy--which is the price for which he sells the bulletin.

An interesting feature of the section's activities is the manner in which fundamental research and practical studies are combined. There is a group of highly specialized physiologists, pathologists, horticulturists and the like, but there is also a group of men in the section who speak the language of the handling, transportation and storage industry as well, and who are splendidly equipped to make and maintain working contacts all along the line. Some, like Earl Mallison, speak out of the either side of their mouth.

NUT INVESTIGATIONS

C. E. Schuster, Corvallis, Oreg.

"So far the rain this season has gone down approximately one foot," he reports November 25th. "In some soils it has not yet reached the 12-inch level while in others it is a little below that. In the mature orchards the soil below that is practically dry. We are watching this moisture distribution in the various plots that we have under various cultural conditions.

"The nut harvest is over. Filberts were cleaned out of the valley practically, or sold, shipment on demand. The walnut harvest is over also and the crop is fairly well graded, showing fair quality--better than was expected. The size of the nuts is often quite small and some red nuts are found along with badly stained material. The price of the walnuts to the average grower is very discouraging, along with a much smaller crop than last year. The demand for walnut trees and information on walnut growing is gradually dropping off, except for professional people and business people who are buying land and putting in crops they are interested in without much regard to the immediate future. Actual bonafide farmers are planting practically none, but there is a constant demand for information from the other type of investors or growers."

Paul W. Miller, Corvallis, Oreg.

"Studies on the effect of spraying walnuts with bordeaux mixture on the size of the nuts were continued in the laboratory during the week, using samples of nuts collected about a month ago from a representative bordeaux-sprayed and untreated plot near Scholl's, Oreg. While the untreated nuts averaged slightly larger than the bordeaux sprayed ones, as determined by the amount of water displaced, the difference was so small as to be insignificant. Thus, the unsprayed nuts displaced, on the average, 17.62 cc of water per nut, while the nuts from the bordeaux-sprayed trees displaced on the average, 17.52 cc of water per nut. Studies on the effect of spraying with bordeaux mixture on the filling of the nuts are in progress."

F. H. Dodge, Shreveport, La. (Robson)

"After all varieties had been harvested it could be seen that 10 of them had made significant increases in yield of nuts this year as a result of bordeaux spraying last year," he reports November 18th. "With most of these varieties there was no crop on the unsprayed trees and a profitable crop on the bordeaux sprayed trees; and with all of these varieties applications of bordeaux had more than doubled the crop. Some of the other varieties showed less differences in favor of bordeaux than these 10 did."

TUNG INVESTIGATIONS

Felix S. Lagasse et al, Gainesville, Fla. (Tung Investigations)

"Some very worthwhile basic facts were determined in the physiological laboratory during the past week for from experimental trial runs on leaf petioles and blades it was found that a six hour Soxhlet Extraction period was necessary to properly extract the alcohol soluble sugars," he writes November 18th. "It was also found that sucrose could be satisfactorily determined in tung foliage by the usual inversion method with 5 percent HCl at room temperature during a 24-hour period.

"Some studies were made and are being continued relative to one of the weak spots in carbohydrate analysis in general, namely the manner of satisfactorily handling the dried filter paper after the residue of plant material has been removed from them after filtration is completed."

George F. Potter, Bogalusa, La. (Tung Investigations)

"A partial analysis was made of the data on growth of tung trees in the nursery," he reports November 25th. "An average group of seedlings shows a rather typical sigmoid growth curve, but with a rather long period about midseason when the rate is fairly uniform. Seedlings of individual trees show rather distinct differences. One such group starts rather slowly in the spring, but by midseason attains a rate somewhat above the average, and this extends into the last of the season, to give the maximum average height of any group. Seedlings from another parent start rapidly in the spring, but also cease growth at a relatively early date, resulting in a total height just slightly above average. The data are extensive and further analysis is expected to add other facts of interest."

DECIDUOUS FRUIT INVESTIGATIONS

John E. Weinberger, Fort Valley, Ga.

"Last week the seedling peach trees in the nematode test block were dug and the roots carefully examined for presence of nematode galls," he writes from the U. S. Horticultural Field Laboratory on November 30th.

"The test was very successful in that all but 22 of 540 trees supposedly susceptible had galls, and only 2 out of 34 varieties tried were completely resistant. It was gratifying to note that three Liao Tao trees, resistant in last year's test and carried over another year, were again completely free from galls. These trees were saved and will be planted in the stock orchard with Yunnan. We may have another variety available as a nema-resistant stock. Seven Purple Leafed seedlings, immune last year and re-tested, were all severely galled. Shallil was the only variety besides Liao Tao that was completely resistant."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Geo. P. Hoffmann (Vegetable crop investigations)

"Newly seeded lawns, previously planted shrubs, and fall planted bulbs are suffering badly because of the prolonged dry spell," he writes November 25th. "Fall gardens--except for collards here and there--are almost a complete failure in this section."

He had written November 18th: "Two groups of students visited the station this week. The first was a group of agricultural students from county high schools all over Lauderdale and Wayne counties. About 100 students and several teachers were in the group. These students were particularly interested in the crops, tree, vine and otherwise, grown and in the methods of growing them. The second group was a science class of about 20 students from Meridian Senior High School, under the direction of their instructor, and was most interested in the laboratory equipment, apparatus and methods."

"November 12th we had our first rain of more than a few hundredths of an inch since August, when 0.62 of an inch of water fell. Because of the very dry condition of the soil, however, this hardly laid the dust.The sweetpotato seedlings are more than interesting both in quantity and quality, yielding in some an almost countless number of strings and in others as much as 500 to 400 bushels an acre. Several of the seedlings gave very low moisture readings, which is suggestive of high starch content."

"Our Triumph sweetpotato plots for starch sweetpotato production and having to do with the mechanical setting of plants, plant spacing in the row and fertilizer placement, were harvested shortly before the middle of November and revealed some very interesting and worthwhile data. This planting consisted of six treatments repeated six times (row length being 40 feet per plot) with total yield ranging from 500 to 400 bushels per acre. Observations thus far seem to indicate in a very convincing way that greater spacing of sweetpotatoes grown for the manufacture of starch might be better than closer spacing heretofore used and generally recommended in the production of table-use sweetpotatoes in which 'jumbo' or oversize roots are not to be desired. Further, early planting, for starch sweetpotatoes is much to be desired."

Atherton C. Gossard (Nut fruit investigations)

"A trip was made to Mobile, Ala. in the late afternoon of November 15th and the following day notes and photographs were made in the rosette experiment started at Grand Bay, Ala. during the existence of the U. S. Pecan Field Station at Spring Hill, Ala. It was interesting to observe that two groups of Stuart trees now about 25 or 24 years old, and 40 to 50 feet tall, remain nearly free of rosette six years after receiving treatments of approximately 1/2 pound and 2 pounds, respectively, of zinc sulphate per year of tree age, and that adjacent untreated trees continue to rosette badly."

SUBTROPICAL FRUIT INVESTIGATIONS

A. D. Shamel, Riverside, Calif.

"In our search this year for promising bud mutations in trees of the Washington Navel and Valencia orange, Eureka and Lisbon lemon and Marsh grapefruit varieties, fruit characters have received special study. Fruit of promising bud mutations has been systematically compared with comparable fruit of 'normal' strains. This includes measurement of weight, size, shape, color, thickness of rind, amount of fiber in the flesh, color of flesh, number of locules, soluble solids-acid ratio, flavor and taste of the juice, as well as notes on some other characteristics of each of ten or more typical fruits for each determination. Ninety-nine determinations of this nature were made during the past summer. When this preliminary fruit study indicates that the bud variation may have possible commercial value, the parent tree or limb from which the fruits were picked is inspected in order to obtain data as to its location, its foliage characteristics, as well as on the quantity of fruit production. Further studies over a period of years will be confined to those variations which apparently have some commercial significance.

"Previously, methods for eliminating the inferior bud mutations were worked out, and introduced into nursery and orchard practices through the systematic selection of propagating material and the top-working or replanting of the undesirable strain trees in bearing orchards which originated from the unintentional use of inferior bud variations. Recently, the systematic selection and testing of apparently desirable bud mutations, as distinguished from those which are due to environmental causes, has been inaugurated.

"Of the large number of citrus bud variations reported and studied thus far, the greater proportion has been discovered by growers. This is due to the fact that only a few orchards can be visited by investigators at the proper season to search for bud variations while thousands of growers and orchard employees who live in the orchards throughout the entire year have far greater opportunities for finding them. For example, there are about ten million trees of the Washington Navel orange variety alone in southwestern orchards and an individual researcher is physically unable to see more than a comparatively few thousand of them at suitable times for finding bud variations. Furthermore, an increasing number of citrus growers and their employees are practising individual tree care during which they are likely to observe abnormal foliage and fruiting characteristics. As the phenomenon of bud variation has become more familiar to those working with the trees, its occurrence is now more likely to be noticed than was the case formerly. For those and other reasons, more examples of bud variations were found and reported during the past season than during preceding years.

SUBTROPICAL FRUIT-INVESTIGATIONS

A. D. Shamel (Continued)

"Although most of the apparent bud mutations reported are commercially inferior to the standard strain of the variety, and many are in fact due to environmental rather than to inherent causes, a few have been found that are apparently superior to the parent varieties in one or more characteristics. Such mutations need to be studied further in experimental orchard tests under the climatic and soil conditions to which they seem best adapted for field culture.

"During April 1939 progeny propagations were made of six of the Washington Navel orange; six of Valencia orange; six of Eureka lemon, one of the Marsh grapefruit, and in addition, a recently introduced orange from Puerto Rico, tentatively called 'Rico 1.' Of the Washington Navel selections, the 'Workman' shows late maturing, long holding fruits having desirable commercial qualities; the 'Robertson' early maturing fruits that are resistant to the so-called 'June drop'; and the 'Rico 1' orange fruit somewhat similar to the Valencia orange except for its earlier maturity, less rag and no seeds.

"The selected Valencia orange varieties include the 'Mohn', with seedless fruits and otherwise desirable Valencia orange characteristics; the 'Corona' with seedless fruits that remain on the trees in good condition for a longer period of time than the normal Valencia fruits; and a selection of a bud variation of the Hart's Tardiff strain in which the trees do not tend to produce the many chimeras that are peculiar to the parent strain.

"The selected lemon mutations include three Eureka strains; the 'Johnson,' with seedless fruits; the 'Ledig' with vigorous, heavy bearing trees that are apparently resistant to early decline; and the 'Chase,' productive and desirable fruiting Eureka type; and a Lisbon variation, the 'Corona', that is productive, resistant to early decline and bears commercially desirable fruits.

"The nursery trees from these propagations will be available for planting in experimental plots during the early spring of 1940 at two locations in the (1) coastal, (2) intermediate, (3) interior and (4) desert regions, respectively. In the cooler and more humid coastal plain and intermediate zones the Valencia orange and lemon selections will be planted, while the Navel and Valencia orange selections will be planted in the hotter, interior and desert zones. In all cases, the performance of the trees of the various selections will be compared with those of trees of the standard commercial strains now in use through randomizing arrangement of the plantings."

SUBTROPICAL FRUIT INVESTIGATIONS

Frank A. Thackery, Indio, Calif.

"The study of various cover crops to determine those best suited to desert soil and climatic conditions, started in 1935, has been continued during the past year. In the preliminary studies we had four rows of each species planted on the first day of each month of the year. Two rows of each species were planted under open field conditions and two under shade of date palms. The rows in all cases were 25 feet in length and two of these rows or one variety planting occupied an area of approximately 56.25 square feet. When the crop reached maturity, or maximum growth, it was harvested and weighed for the green weight. It was then sacked and air dried in the barn to get the dry weight. However, in the case of planting in shade of date palms the row planting was not desirable because, due to lack of space, it was not possible to so locate all rows that all plants would be equally exposed to shade and to competition by date palm roots.

"Although these small acre tests served their purpose for preliminary study, we found it advisable to devote larger areas to each cover crop in order to procure data sufficiently accurate for permanent record. Even then injury at certain seasons of the year by birds and by mildew has been serious to some of the crops. As the studies have progressed we have eliminated species showing little promise, until we now have space which enables us to make plot plantings under orchard conditions 50 by 120 feet or 5600 square feet, with plots arranged to expose each cover crop to approximately similar standing and competition by date palms. The observations include quantity of root growth and depth of penetration of roots. Yield is now based on one sample from 9 square feet. After determining fresh weight, oven dry weight is obtained.

"The following cover crops have been tried one or more years:

| | |
|---|---|
| *Soybean (<i>Soja max</i>) | Vetch, common (<i>Vicia sativa</i>) |
| *Tepary bean (<i>Phaseolus acutifolius</i>) | *Vetch, hairy (<i>Vicia villosa</i>) |
| *Cowpea (<i>Vigna sinensis</i>) | *Vetch, purple (<i>Vicia atropurpurea</i>) |
| Austrian winter pea | *Sesbania (<i>Sesbania macrocarpa</i>) |
| *Pigeon pea (<i>Cajanus indicus</i>) | Buckwheat (<i>Fagopyrum esculantum</i>) |
| Wedge pea (<i>Lathyrus sativus</i>) | Giant pigweed (<i>Amaranthus spp.</i>) |
| *Huban clover (<i>Melilotus alba annua</i>) | Atroplez (<i>Atroplex hortensis</i>) |
| Melilotus (<i>Melilotus alba</i>) | German millet (<i>Choetochloa italica</i>) |
| *Melilotus (<i>Melilotus indica</i>) | Maximum) |
| *Guar (<i>Cyamopsis tetragonoloba</i>) | Malva (<i>Malva moschata alba</i>) |
| Fenugreek (<i>Trigonella foenumgraecum</i>) | Mustard, wild black (<i>Brassica nigra</i>) |
| Crotalaria (<i>Crotalaria spectabilis</i>) | Mustard, trieste (<i>Brassica spp.</i>) |
| Crotalaria (<i>Crotalaria stricta</i>) | Mustard, yellow (<i>Brassica spp.</i>) |
| Lespedeza (<i>Lespedeza striata</i>) | Common rye, (<i>Secale cereale</i>) |
| Lespedeza (<i>Lespedeza stipulacea</i>) | Eastern rye (<i>Secale spp.</i>) |
| Vetch, (Bard <i>Vicia calcarata</i>) | Rosen rye (<i>Secale spp.</i>) |
| Vetch (<i>Cracca vogili</i>) | *Sudan grass (<i>Andropogon sorghum var.</i>) |

* These have shown promise.

SUBTROPICAL FRUIT INVESTIGATIONS

Frank A. Thackery (Continued)

"Such non-legumes as Sudan grass and barley grow well, but lack of orchard space necessitates their omission from current plots. Starred (*) crops in the preceding list have shown promise. Wedge pea, giant pigweed, and Malva have only recently been included. For fall or winter seeding (with turning under in late spring) Hubam clover, *M. indica* and several vetches seem adapted to our conditions. For late spring or early summer planting (with turning under in late summer) guar, sesbania, soy bean, pigeon pea, and Tepary bean are all satisfactory.

"Definite superiority in such characteristics as earliness of maturity, root penetration, and adaptability to saline conditions remains to be determined."

ADMINISTRATIVE NOTES

Furloughs in Excess of one Year.

The United States Civil Service Commission, says a memorandum No. P-54 from the Department's Director of Personnel, has advised us that the Commission does not consider that an employee who has been on furlough in excess of one year is on the rolls; that is, if an appointing officer wishes to restore such an employee to duty, he should request authority of the Commission in the usual manner, in accordance with Civil Service Rule IX. The Commission, however, will not require corrective action in the case of employees who have been restored to duty after a furlough exceeding one year.

"In view of this, the Director of Personnel says that "no employee of the Department of Agriculture will hereafter be furloughed or granted leave without pay, for any reason, for periods in excess of one year. This requirement is being made uniformly applicable to all employees, whether with Civil Service status or not, and regardless of the reason for furlough or leave without pay. The appointment of any employee who has been on leave without pay for furlough continuously for a period of one year should be terminated effective the date of the expiration of his year's furlough or leave without pay. This...supplements the instructions contained in Department Regulations Nos. 2561, 2611 and 2812..."

Husmann dies. The older employees of the Division will learn with regret of the death November 21, 1959, at his home in Napa, Calif. of one of their former colleagues, George C. Husmann. Mr. Husmann, who was in his 79th year, served with us for 30 years in connection with grape investigations, retiring in 1931.

ADMINISTRATIVE NOTES

Electric Batteries In "Memorandum Regarding Automotive Equipment" sent out under date of May 1, 1939, particular attention was called to the fact that tires, tubes and batteries were on contract for delivery throughout the United States. However, on several occasions recently we have been called on by the Bureau Accounting Office to furnish statements to support purchases of batteries for automotive equipment, these purchases having been made in the field from other than the scheduled contractors.

The Firestone Tire & Rubber Company, which maintains agencies in most localities, has the contract for emergency delivery of batteries for the period from September 1, 1939 to August 31, 1940, as set forth in General Schedule of Supplies Classes 16 and 17, Supplement No. 2. This covers purchases of not to exceed two batteries under any one item. Consult your nearest Firestone Tire and Rubber Company agency when in need of a battery replacement, or send your order to our Business Office to be filled by the contractor's agency nearest to you.

If some unexpected emergency makes necessary the purchase of a battery from other than the contractor, a statement in triplicate should accompany the voucher giving full details as to why it was impracticable to meet the requirements from the scheduled list.

In this connection, attention is invited to the fact that spark plugs, electric fans and parts therefor are also on contract for use within the continental limits of the United States. See Schedule 17, Supplement No. 1, when in need of these items.

Letter Writing Apropos the News Letter's recent items on the importance of care in preparing official correspondence, one of our readers sends us a page from Canning Trade for November 27, 1939, containing the following vile slander!

"The widow of a farmer had some difficulty with her hens and wrote the following letter to the Department of Agriculture at Washington: 'Something is wrong with my chickens. Every morning I find two or three lying on the ground cold and stiff with their feet in the air. Can you tell me what is the matter?' After a little while she received the following reply: 'Dear Madam: Your chickens are dead.'"

Of course, we have plenty to do looking after the interests of the horticultural workers, but we venture a defense of the Department's chicken experts by pointing out that it was Mark Twain who made this diagnosis; not a Department man; at least we haven't been able to find Mark's name on the personnel records!

Vol. 11 No. 24

December 15, 1939

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



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THE UNITED STATES OF AMERICA

IN SENATE, January 10, 1917.

REPORT OF THE COMMISSIONERS OF THE GENERAL LAND OFFICE

IN RESPONSE TO A RESOLUTION PASSED BY THE SENATE

ON JUNE 15, 1916.

WASHINGTON: GOVERNMENT PRINTING OFFICE: 1917.

COMMISSIONERS OF THE GENERAL LAND OFFICE

WALTER B. WOODRUFF, Chairman

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